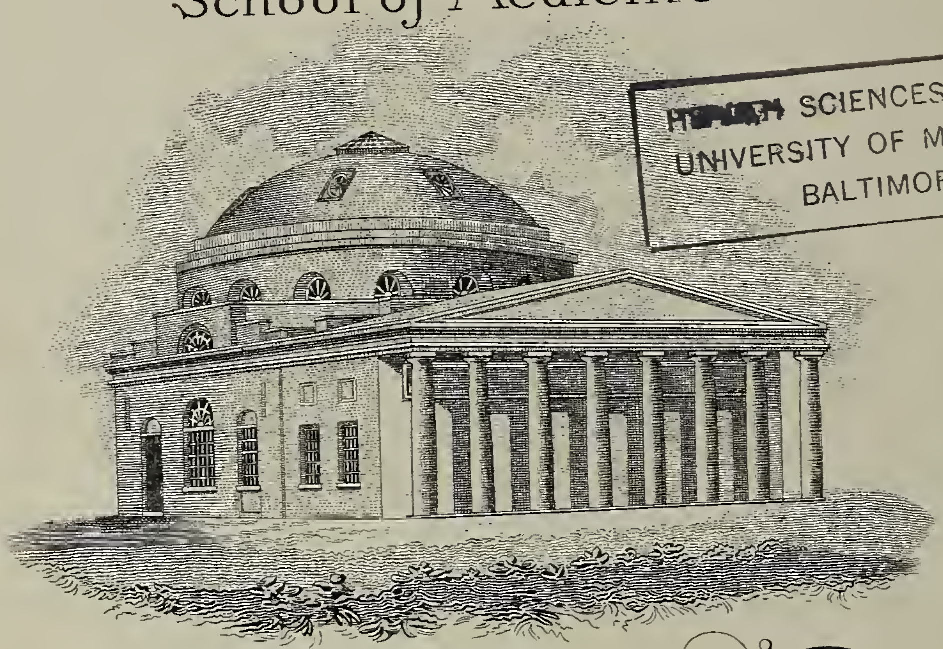
Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

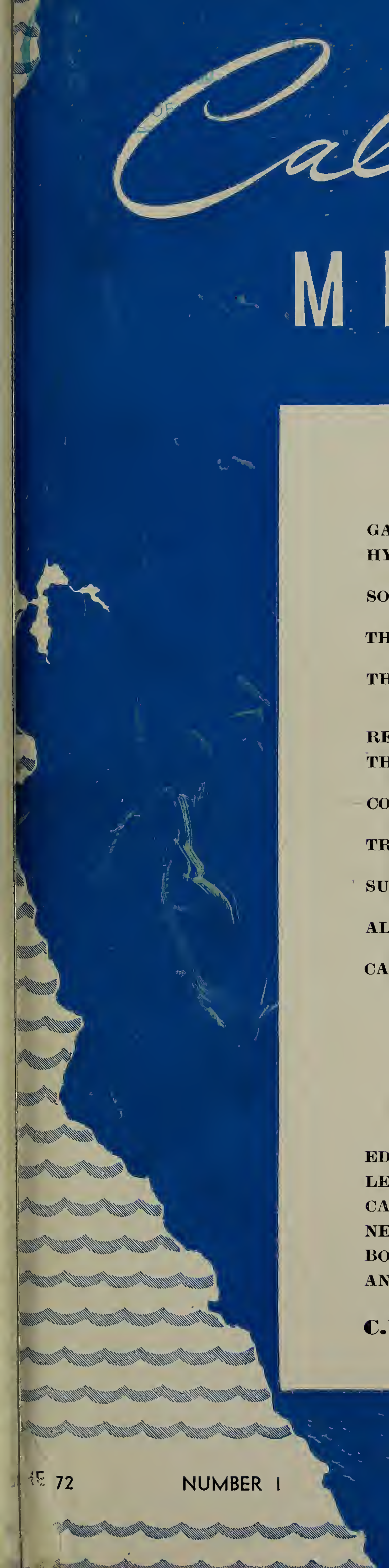
AUG 1 0 1951

LIBRARY
OF THE
School of Medicine



[redacted] SCIENCES L Y
UNIVERSITY OF MAR AND
BALTIMORE

University of Maryland



California MEDICINE

School of Medicine Lbry
University of Maryland
Baltimore, Maryland

JANUARY 1950

GASTROINTESTINAL ALLERGIC DISEASE, Chester M. Jones, Boston 1
HYPERTENSIVE-ISCHEMIC LEG ULCERS, Eugene M. Farber and Otto E. L. Schmidt, San Francisco 4
SOME ASPECTS OF THE MANAGEMENT OF BILATERAL CALCULUS DISEASE OF THE KIDNEY, R. H. Flocks, Iowa City, Iowa 7
THE EXCRETION OF DIGITOXIN, René Bine, Jr., Meyer Friedman, and Sanford O. Byers, San Francisco 14
THE SYNDROME OF PROXIMAL JEJUNAL LOOP OBSTRUCTION FOLLOWING ANTERIOR GASTRIC RESECTION, William F. Quinn and John H. Gifford, Los Angeles 18
RECENT TRENDS IN PUBLIC HEALTH, Malcolm H. Merrill, Berkeley 22
THE SHOE-FITTING FLUOROSCOPE AS A RADIATION HAZARD, Leon Lewis and Paul E. Caplan, Berkeley 26
COCCIDIOIDIN SKIN TESTING DURING PREGNANCY AND IN INFANTS AND CHILDREN, Robert Cohen and Robert Burnip, Bakersfield 31
TRACHEOTOMY IN BULBAR POLIOMYELITIS, Alden H. Miller and Leonard S. Buck, Los Angeles 34
SURGICAL MANAGEMENT OF THE INJURED LARGE BOWEL, Samuel Gendel, Anaheim 37
ALCOHOLISM—Studies by a Special Committee of the California Medical Association 40

CASE REPORTS:
- The Symptomatic Treatment of Paralysis Agitans with Benadryl: Report of Two Cases, Edwin Owyang, San Francisco 57
- Acute Volvulus of the Cecum—A Method of Diagnosis, with Report of a Case, Harold H. Lindner and Sanford Marcus, San Francisco 58
- Niemann-Pick's Disease and Its Relationship to the Lipoidoses, Ralph E. Knutti, Los Angeles 60

EDITORIALS 64
LETTERS TO THE EDITOR 66
CALIFORNIA MEDICAL ASSOCIATION 67
NEWS AND NOTES 72
BOOK REVIEWS 75
ANTISPASMODICS .... Adv. Page 68

C.M.A. Annual Meeting, April 30-May 3, 1950, San Diego

OFFICIAL JOURNAL
OF THE CALIFORNIA MEDICAL ASSOCIATION

72 NUMBER 1

portrait
of a
syndrome:

ULCERATIVE COLITIS

The patient with ulcerative colitis needs psychiatric, dietary, medical, and possibly surgical care. SULFATHALIDINE *phthalylsulfathiazole is particularly valuable for medical control because of its small dose, bactericidal efficiency, and negligible toxicity.*

SHARP & DOHME

Indications: Ulcerative colitis, regional ileitis. Intestinal surgery, to reduce incidence of peritonitis, speed recovery.

Actions: Reduces enteric coliform bacteria, even during diarrhea; controls cramps and bloody stools of ulcerative colitis within 48 hours; reduces threat of peritonitis, aids recovery in enteric surgery.

Advantages: Low dose (3 to 6 Gm. daily), low cost, negligible toxicity. Bowel retains 95% of dose. Supplied in bottles of 100, 500, 1,000 tablets, 0.5 Gm. Sharp & Dohme, Philadelphia 1, Pa.

Sulfathalidine®

tablets phthalylsulfathiazole, 0.5 Gm.

UNIVERSITY OF MARYLAND
LIBRARY
Founded 1813
SCHOOL OF MEDICINE

California
MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION
© 1950, by the California Medical Association

VOL. 72 JANUARY 1950 No. 1

Gastrointestinal Allergic Disease

CHESTER M. JONES, M.D.,* *Boston*

SUMMARY

Gastrointestinal allergic disease undoubtedly does exist, but its frequency has been tremendously overrated. It is believed that in many cases there is not sufficient evidence for attributing chronic, recurrent digestive disturbances to allergic reaction, and that skepticism is particularly important because such a diagnosis exposes the patient to an unwarranted type of dietary management that is complicated, frequently unwise, and not too infrequently used as a substitute for critical clinical thinking.

The demonstration and subsequent elimination of allergic substances that may at times be productive of digestive symptoms is, of course, important, and when based on proper evaluation of a carefully taken history will undoubtedly yield brilliant results.

THE only cases that may properly be classified as allergic disease of the digestive tract are those in which there is a tissue change in some portion of the alimentary canal caused by an antigen-antibody cell reaction. Such an alteration is entirely analogous to the wheal reaction in urticaria or the bronchial changes incident to an attack of bronchial asthma. It represents the reaction of a tissue sensitized to a specific allergen. It is essentially a reversible reaction and one which is reproducible following adequate exposure to the given allergen. As pointed out by Cooke, the mistake must not be made of considering allergic reaction to food and gastrointestinal allergic diseases as synonymous. Nor should the digestive symptoms encountered during other allergic disturbances, such as bronchial asthma, be of necessity laid to true gastrointestinal allergic disease. In many, if not in most such instances, the coexistent indigestion and dyspepsia are due primarily to autonomic nerve disturbances. Heartburn, eructation, abdominal distress and similar symptoms are commonly encountered in asthmatic patients during critical or even moderately severe attacks, and certain foods are frequently incriminated. With the cessation of the attack, the patient normally finds that the suspected foods may be taken with impunity in the vast majority of cases. That foods may cause skin or bronchial reactions is too well known to require comment. The urticaria caused by the ingestion of such substances as shell fish or strawberries has been recognized for many years. These and similar disturbances are examples of true allergic reactions to food, and such examples may be multiplied almost indefinitely. They do not, however, as a rule, constitute examples properly classified as allergic disease of the digestive tract. Furthermore, general symptoms, such as coated tongue, bad breath, "repeating" after certain foods, and vague dyspeptic disturbances following the ingestion of specific foods have been too frequently interpreted as sensitization phenomena without sufficient care having been taken to rule out all other causes of indigestion.

The exact incidence of true gastrointestinal allergic disease is certainly not known. Despite the insistence of certain observers that allergic disturbance of this kind is common, the author believes that evidence for such opinions is almost completely lacking or is open to serious doubt. During a prolonged conversation with the late Dr. Warren Vaughan, an enthusiastic allergist, he agreed that true allergic disease of the alimentary tract is un

---

* Clinical Professor of Medicine, Harvard University; Physician, Massachusetts General Hospital, Boston.

Presented before a joint meeting of the Sections on General Medicine, General Practice and Allergy at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

common. This comment was finally made after a careful perusal of his voluminous personal files. Similarly, Rackemann has informed the author that, according to a strict definition, cases of proven or even strongly suspected gastrointestinal allergic disease are rare in his practice, which consists largely of patients with allergic disorders. Cooke believes that "acute gastrointestinal symptoms with or without systemic evidence (urticaria, asthma) from allergic lesions reasonably assumed to exist in the tract are unusual but not rare." It must be mentioned that certain others entertain quite opposite views on the subject, but it is believed that their impressions are based on a rather uncritical evaluation of the term under discussion.

As an internist especially interested in digestive disorders, the author can only state definitely from his own experience that clearly proven or even reasonably clear examples of gastrointestinal disturbances due solely or mainly to allergic manifestations are very uncommon. Furthermore, the author believes that in adults allergic reactions to food occur with much less frequency than is commonly believed. Again and again patients present themselves with various digestive symptoms that are attributed to positive skin tests without there being any reasonable correlation between the two. Foods to which they are presumed to be sensitive on the basis of dermal reactions are frequently eaten with complete impunity, and what is really needed is a readjustment of eating or other habits rather than the elimination of one or many specific foods.

It is probable that some of the confusion in properly classifying many cases lies in an inadequate conception of the underlying or fundamental tissue changes occurring in the alimentary tract mucosa during an allergic response to specific substances. Experimental and clinical observations have clearly demonstrated the nature of such changes. In sensitized dogs, gastroscopic observations have been made of the gastric mucosa after experimentally produced general allergic shock. The appearance of the mucosa as seen through a gastroscope has been described as that of acute gastritis, with redness, edema, spasm, and hypersecretion; hyperacidity is present. Experimental lesions produced in the guinea pig after anaphylactic shock consisted primarily of petechial hemorrhages. Such changes have been interpreted as general reactions due to circulatory changes, rather than as local tissue reactions that were strictly anaphylactic in nature.

Local anaphylactic changes have been produced in the stomach by topical injection of the antigen in the pyloric area following previous sensitization. These lesions were in the nature of Arthus reactions and were followed by temporary ulceration.

Observations have been made in human beings demonstrating that mucous membrane already exposed at ileostomy and colostomy sites could be sensitized, with local mucosal changes analogous to those elicited in the skin, with the production of edema, hyperemia, and in these instances an increase in motility and mucous secretion. Similarly, clinical observations on human beings seemed to indicate that during gastric disturbances secondary to an allergic reaction, gastric hypersecretion and hyperacidity occur with at times profound motor disturbances suggesting spasm, hyperperistalsis and, in the small intestine, abnormal segmentation. These changes are in no sense characteristic of an allergic disturbance alone. Rather, they represent a characteristic response at any level of the gastrointestinal tract to abnormal stimulation, whether it be due to local irritation or to the effects of overactivity of the autonomic nervous system.

Careful perusal of Beaumont's original observations and, more particularly, of the recent dramatic studies carried out by Wolff and his collaborators indicates clearly the gastric response to any kind of overstimulation. These changes are entirely comparable to those noted in experimentally produced allergic disturbances and involve motor, secretory and vascular alterations that are common to the entire tract. Edema and hyperemia at any level are always associated with increased smooth muscle activity and increased secretion. These phenomena are identical with those noted by White and the author in the distal colon following local irritation produced by the topical application of hypertonic solutions, soapsuds, turpentine, and solutions of cholinergic drugs, and in no way differ from what was to be noted after the parenteral or oral administration of preparations such as carbaminoylcholine or mecholyl. Furthermore, similar changes were noted by White and the author and by a large number of other observers in cases of so-called "mucous colitis," a disturbance that is fundamentally associated with abdominal discomfort, alterations in bowel activity and local evidences of hyperemia, increased motor irritability and hypersecretion. The local irritation may, in some instances, proceed to a point where mucosal bleeding can be observed. In the vast majority of instances, "mucous colitis" is not a manifestation of an allergic disturbance but rather of abnormal stimulation of the large bowel either by orally ingested irritants or by excessive autonomic stimulation.

Because of the common response of the digestive tract to various types of overstimulation, it is impossible to differentiate alimentary allergic phenomena from those caused by other mechanisms as demonstrated by routine methods of study, such as gastric analysis, radiological measures, gastroscopy or sigmoidoscopy. As a corollary, it is obvious that gastrointestinal symptoms distinctively on an allergic basis cannot be differentiated from those secondary to a multitude of causes that are commonly encountered in the practice of medicine. For this reason, it seems particularly important to stress the necessity for careful and critical evaluation of the history in a patient allegedly suffering from indigestion secondary to allergic causes before subjecting the patient to the dietary restrictions inherent in any elimination regimen. In fact, unless a meticulous history reveals a clean-cut association between specific foods, drugs or other allergens and symptoms that are predominantly related to the digestive tract, and unless such symptoms can be reproduced by the ingestion of such specific substances, the diagnosis of gastrointestinal allergic disease should be viewed with grave suspicion.

In the mouth, this presents a relatively simple problem, inasmuch as edema of the tongue, buccal mucous membrane and pharynx, or the occurrence of the lesions of stomatitis can be easily demonstrated following the exhibition of specific substances that can be elicited from a history and much less frequently by skin test. As a rule, in all forms of gastrointestinal allergic disease the importance of skin tests has been tremendously overrated. Esophageal spasm can be the local manifestation of an allergic reaction, but the symptoms are entirely analogous to spasm of the esophagus associated with trigger action of the smooth muscle around a diverticulum, an ulcer or a hiatal hernia, and must be sharply differentiated from these by careful x-ray studies and again by a history of constant association with a given substance or substances. Although it is occasionally true that attacks of peptic ulceration may be precipitated by the eating of specific foods, such occurrences are rare indeed and such an explanation is only occasionally warranted.

Digestive tract symptoms, which may include any or all of the various manifestations of so-called indigestion, if on an allergic basis usually manifest themselves in one of two fashions—either by an almost immediate reaction following the ingestion of specific substances, or by a reaction that is delayed by many hours. The immediate reaction is usually apparent and well recognized by the patient himself, with the result that specific foods or drugs are avoided because of previous experiences. These experiences may or may not be associated with skin or bronchial manifestations and by themselves undoubtedly constitute true gastrointestinal allergic disease. The identity of a delayed reaction is much more difficult to determine, and no diagnosis based on the phenomenon of an allergic disturbance should be entertained until all other possible causes have been eliminated, including those usually classified as functional or psychosomatic in origin.

The frequency with which smooth muscle disturbances occur in the alimentary canal, with associated spasm, hyperemia and excessive secretion secondary to emotional stresses and strains, nervous fatigue and faulty habits of living, is well recognized by most internists. Too frequently, however, there is a tendency to ascribe such disturbances to the ingestion of certain food substances or other "allergens," without adequate investigation. Such an investigation frequently is time-consuming and prolonged by many weeks or months before a final answer is obtained. If allergic factors are responsible for the symptoms, then eventually the taking of a careful food diary will usually establish the causative relationships. Skin tests may occasionally help, but they are often misleading and do not by themselves warrant the placing of patients on restricted diets or so-called elimination diets, many of which are insufficient in calories or vitamin content, particularly if employed over long periods of time. It is just as important to determine the physical and emotional state of a patient when he eats certain foods as to determine what foods he is accustomed to eat or what medicines he takes.

Patients may be allergic to phenolphthalein, cascara and other cathartics, with resulting gastrointestinal as well as skin manifestations. It is equally true, however, that abdominal discomfort may be produced by these substances simply because they are irritants, without any implication of allergic disturbance.

The really important and at times difficult situations that are solely on an allergic basis as relates to the gastrointestinal tract consist in those abdominal emergencies accompanied by intense pain, fever, leukocytosis and not infrequently nausea and vomiting. These attacks simulate surgical emergencies dependent upon partial or complete intestinal obstruction, acute appendicitis, volvulus, intussusception, and the like. Individual instances in which the eventual explanation was found to be an allergic factor are to be met throughout the literature. Their occurrence in the experience of individual physicians is certainly uncommon. In many cases the diagnosis is not apparent until a laparotomy has been performed. A typical example of such an abdominal crisis is to be found in the abdominal attacks associated with so-called Henoch's purpura, a condition predominantly seen in children but which can be encountered at any age.

In those instances in which there has been a previous history of urticaria, purpura or joint manifestations, proper suspicion may be entertained at the time the acute abdominal condition is being evaluated. Even when allergic reaction is suspected, however, a decision in favor of conservative measures is frequently difficult and may be improper. If previous allergic symptoms can be elicited or if at operation a localized area of hyperemia and edema only is found, then it may be possible to establish the etiologic importance of one or more specific substances to which the patient is sensitive. This is the classical type of gastrointestinal allergic disease, which occurs infrequently but is of great interest and serves as a basis for the understanding of other minor symptom complexes.

In a specific disease such as ulcerative colitis, attempts have been made to explain the manifestations of the disease on the basis of allergic difficulties. With a mucous membrane that is not intact, it is highly probable that from time to time sensitization to specific foods, bacteria or drugs may occur in this group. Such sensitization is almost certainly acquired after the onset of the disease and is of importance only as another factor in the control or alleviation of the symptoms of this devastating disease. The danger inherent in thinking that allergy plays an important role in ulcerative colitis lies in the fact that dietary limitations may impose severe nutritional lacks which in themselves are dangerous.

Hypertensive-Ischemic Leg Ulcers

Eugene M. Farber, M.D., and Otto E. L. Schmidt, M.D., *San Francisco*

SUMMARY

Ischemic ulcers of the leg having characteristics different from those of ordinary leg ulcers have been observed in a small number of hypertensive patients, mostly women, during the past few years.

Such ulcers are usually located above the ankle. They begin with a small area of purplish discoloration at the site of slight trauma, and progress to acutely tender ulceration.

In studies of tissue removed from the margin and the base of an ulcer of this kind, obliterative arteriolar sclerotic changes, ischemic-appearing connective tissue and inflammatory changes were noted.

Two additional cases are reported.

In the course of several years the authors have observed a small number of patients who had painful, ischemic ulcers of the leg that differed from the usual ulcers of the extremities. The lesions occurred in almost every instance in women, and all the patients had a history of hypertensive disease of long duration.

Hines, who first noted the condition in a patient in 1941, published a preliminary report[4] in 1946 describing the clinical and histopathological features observed in 11 patients with ischemic ulcers occurring in the presence of hypertension. It was thought that the condition might be a new syndrome, and Hines postulated that changes similar to those in the retinal vessels of hypertensive patients were present in the arterioles of the skin and subcutaneous tissues, giving rise to superficial infarctions in the skin. Martorell[7] and Valls-Serra[8] at about the same time also reported studies of ischemic-appearing leg ulcers in hypertensive patients. Wright[9] reviewed these studies and added reports of cases observed by him.

Since the preliminary report in 1946, Hines and Farber[5] have observed 24 additional patients with hypertensive-ischemic leg ulcers. All but two of the patients were women.

DESCRIPTION OF A TYPICAL LESION

The ulcers are usually located on or above the lateral malleolus and range in size from 1 to 10 cm. in diameter. The border is soft and ill-defined and the base is ischemic-appearing. Usually the ulcer is superficial and the skin adjacent to it in most cases is normal in appearance. Cutaneous sclerosis is absent; hemosiderosis around the lesion is slight or absent.

DEVELOPMENT AND COURSE OF THE ULCER

Often there is history of slight trauma at the site of the lesion. The first sign is a superficial purplish discoloration, 0.5 to 1 cm. in diameter. This progresses by peripheral extension and the lesion breaks down centrally to form a superficial exquisitely tender ulcer. Healing is very slow and may not occur for four to six months. Rest in bed does not seem to influence the speed of recovery. Pressure dressings, supporting bandages and local antibiotic therapy are sometimes helpful. When healing does occur, the pain rapidly disappears and the only residual defect is a superficial, slightly depigmented scar.

PATHOLOGY

It is generally accepted that a diffuse disturbance of the arterial side of the vascular system exists in hypertension.[3,1,6] The cutaneous arterioles of patients with essential hypertension reveal sclerotic arteriolar changes identical to those found in the kidneys, retina, muscles and other organs of hypertensive patients.[2]

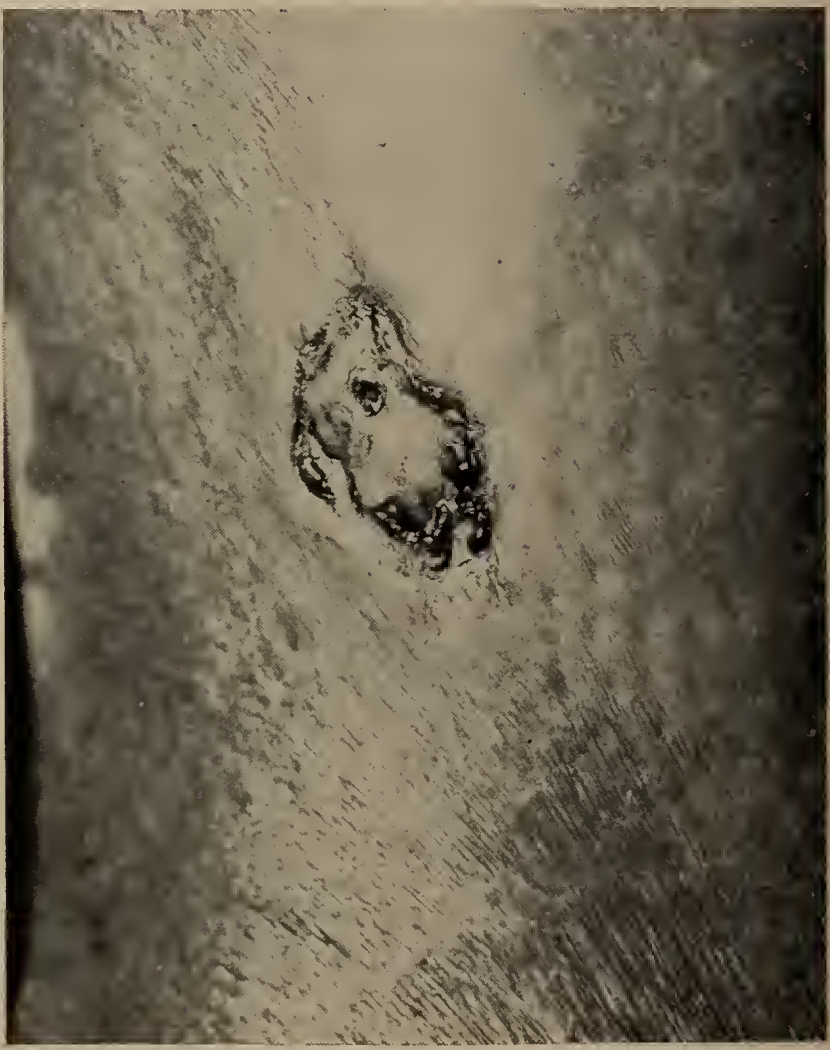


Figure 1.—Ischemic ulcer of the leg (Case 1).

From the Division of Dermatology, Department of Medicine, Stanford University School of Medicine.

Presented before the Section on Dermatology at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

Biopsy specimens taken by excision and punch from the margin and from the base of an ulcer of the kind under discussion reveal arteriolar sclerotic changes. The arterioles are considerably thickened and many occluded. The cutis reveals some homogenization of the connective tissue. Many of the thickened and occluded arterioles are surrounded by a dense infiltration of polymorphonuclear leukocytes. Venules and veins were not thrombosed in the material studied. The sections studied serially revealed consistent obliterative sclerotic arteriolar changes, ischemic-appearing connective tissue, and inflammatory changes.

DIFFERENTIAL DIAGNOSIS

The lesion must be distinguished particularly from chronic pernio, from the ulcerations of livedo reticularis, from stasis ulcers due to chronic venous insufficiency, and from so-called "senile skin ulcers." Before a diagnosis of hypertensive ulcer of the leg is made, the usual causes of leg ulcers should be excluded. Careful examination of the arterial and venous systems should be made. The criteria for the diagnosis of hypertensive-ischemic leg ulcers should include: Hypertension; an ischemic-appearing ulcer unresponsive to conventional therapy; moderate to severe pain; indolence; typical changes of arteriolar sclerosis pathologically.

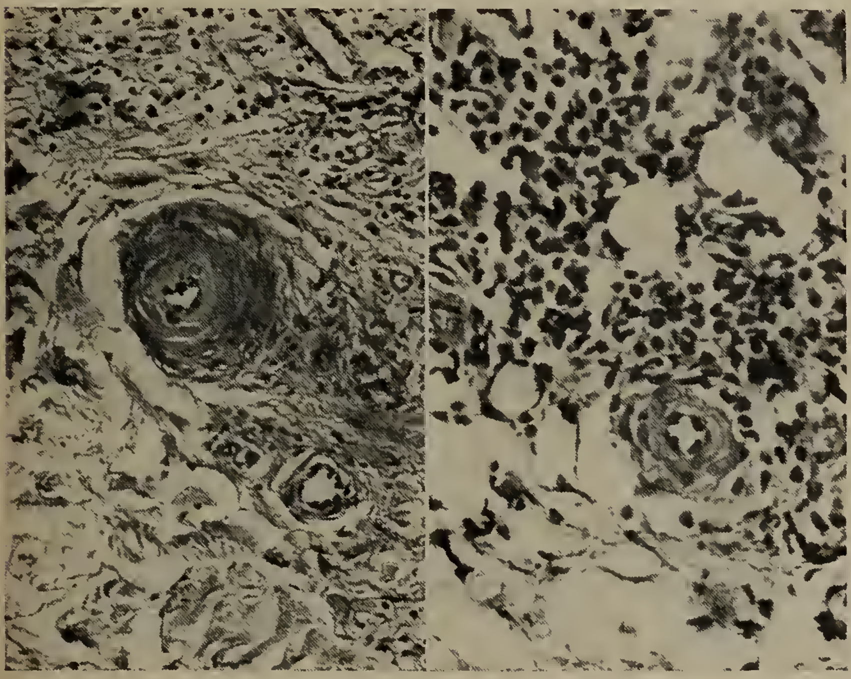


Figure 2.—(*Left*) Tissue from ulcer (Case 1). The media of the arteriole is hypertrophied and the lumen is narrowed. (*Right*) Tissue from ulcer (Case 1) showing a dense inflammatory reaction and a thickened arteriole in the mid-portion of the cutis.

In view of the fact that there is as yet little in the literature on this subject, two additional cases of ischemic ulcers of the leg in hypertensive patients are reported here.

CASE REPORTS

CASE 1: A 63-year-old Negro woman entered the Stanford University Hospitals on July 16, 1948, complaining of painful ulceration of the right leg. The lesion was reported to have started six months previously following slight trauma. It gradually enlarged and became increasingly painful. In January 1948 an ulcer had developed over the right Achilles tendon. This lesion was extremely painful but it healed after five months. The left leg had been amputated in 1927 because of severe third degree burns. There was no history of thrombophlebitis, syphilis, use of drugs or of blood dyscrasia.

Upon physical examination, a superficial, ischemic-appearing ulcer on the lateral aspect of the right leg was noted. The base of the ulcer contained indolent granulation tissue and the margin was soft. Slight pressure on the lesion caused exquisite pain. There was no evidence of varicose veins or of chronic venous insufficiency. Arterial pulsations were normal. The blood pressure was 230 mm. of mercury systolic and 120 mm. diastolic. Pronounced sclerosis and narrowing of the retinal arterioles were noted in the ocular fundi. The urine was normal, and results of serologic tests for syphilis were negative. The hemoglobin, erythrocyte and leukocyte determinations were within normal limits. There was no sickling of the erythrocytes. Cultures taken from the ulcer showed a heavy growth of coagulase-positive Staphylococcus aureus. Biopsy specimens were taken from the ulcer and from skin adjacent to it.

The lesion was treated by bed rest, topical applications of antibiotics and supporting bandages. The ulcer gradually became less painful and after seven months was completely healed.

* * *

CASE 2: A 60-year-old white woman was first examined at the Stanford University Hospitals Nov. 23, 1948, because of an ulcer on the left ankle of two months' duration. The lesion was said to have begun at the site of a small bruise that had been received in a fall on a graveled road. It had enlarged peripherally and had broken open in the center to form a superficial ulcer which became so painful that walking was difficult. There was no history of phlebitis or of any serious illness. Intermittent claudication had never been noted. The blood pressure was known to have been elevated for ten years.

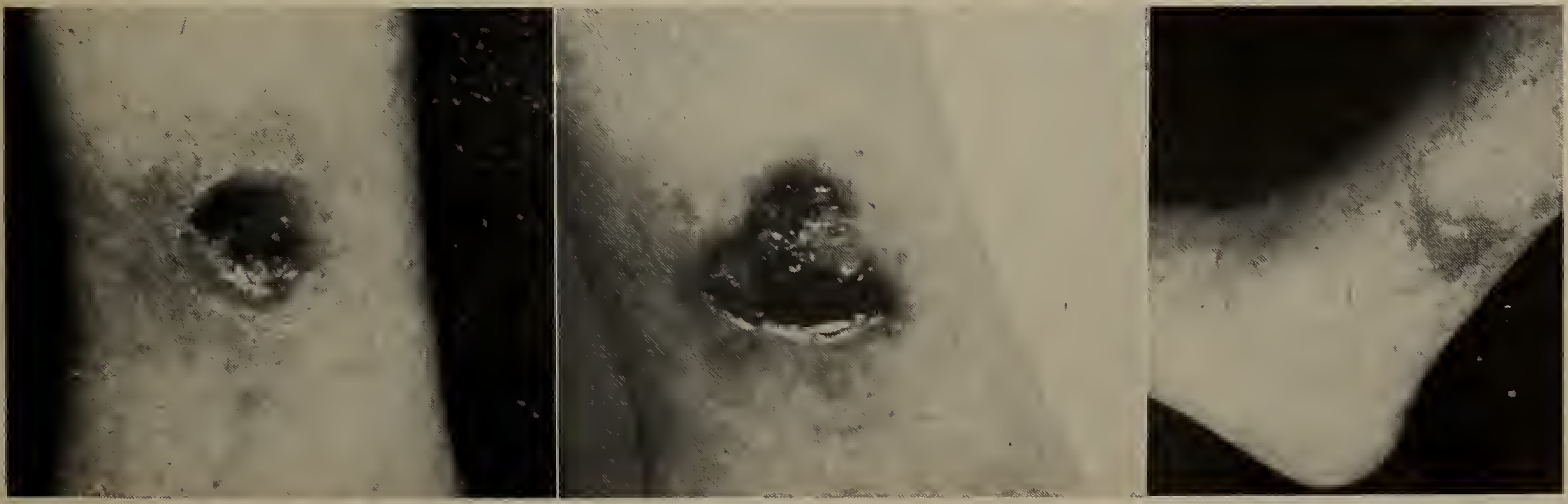


Figure 3.—(*Left*) Ischemic ulcer in the lateral surface of the leg (Case 2). (*Center*) Same ulcer two months later. (*Right*) Healed ulcer seven months after onset.

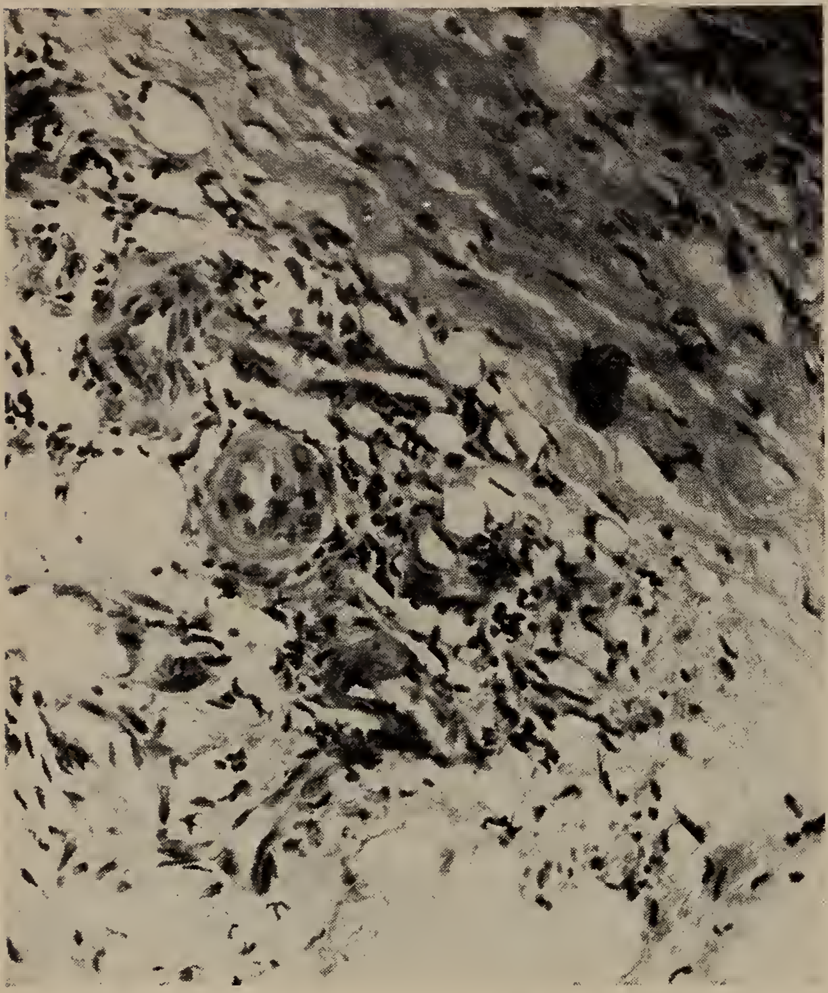


Figure 4.—Tissue from ulcer (Case 2) showing arteriolar sclerotic changes and perivascular inflammatory reaction.

On physical examination, a superficial, sharply punched-out, soft-edged ulcer, 1.5 cm. in diameter, was noted above the left lateral malleolus. No cutaneous sclerosis was present and only a small amount of pigmentation was scattered around the ulcer. Slight pressure on the lesion resulted in severe pain. The greater saphenous veins were dilated bilaterally but were apparently competent. Palpation of the peripheral vessels revealed slightly diminished pulsations of the dorsalis pedis arteries. There was no pallor following elevation of the feet and no rubor following dependency. A roentgenogram of the lower extremities showed no evidence of calcification of the peripheral vessels.

The blood pressure was 250 mm. of mercury systolic and 140 mm. diastolic. Results of laboratory studies of the blood and urine were within normal limits, and serologic tests were negative for syphilis. A culture from the exudate yielded a small growth of E. coli. A biopsy specimen was taken from the margin of the ulcer.

The patient was confined to bed and during the next two months the ulcer gradually enlarged, almost doubling in diameter. Following continued applications of various antibiotics, the ulcer began to heal and the pain diminished. Approximately seven months after the ulcer first appeared, healing was complete.

REFERENCES

1. Bell, E. T., and Clawson, B. J.: Primary (essential) hypertension; a study of 420 cases, Arch. Path., 5:939, 1928.

2. Farber, E. M., Hines, E. A., Montgomery, H., and Craig, W. McK.: The arterioles of the skin in essential hypertension, J. Inves. Derm., 9:6, Dec. 1947.

3. Fishbein, A. M.: Anatomic findings in essential hypertension, Arch. Int. Med., 35:650, 1925.

4. Hines, E. A., and Farber, E. M.: Ulcer of the leg due to arteriosclerosis and ischemia, occurring in the presence of hypertensive disease (hypertensive-ischemic ulcers): A preliminary report, Proc. Staff Meet. Mayo Clinic, 21:337-346, Sept. 4, 1946.

5. Hines, E. A., and Farber, E. M.: Unpublished data.

6. Kernohan, J. W., Anderson, E. W., and Keith, N. M.: The arterioles in cases of hypertension, Arch. Int. Med., 44:395, 1929.

7. Martorell, F.: Las ulceras supremaleolares por arteriolitis de las grandes hipertensas, Actas de los Reuniones Cientificas del Cuerpo Facultativo del Instituto Policlinico, Platon 1, Barcelona, Dec. 1945.

8. Valls-Serra, J.: Sobre el tratamiento de la ulcera supramaleolar de las grandes hipertensas, Actas de las Reuniones Cientificas del Cuerpo Facultativo del Instituto Policlinico, Vol. 3, Sept.-Oct. 1946.

9. Wright, I. S.: Vascular Diseases in Clinical Practice, The Year Book Publishers, 1948.

Discussion by N. E. Freeman, M.D., *San Francisco*

Dr. Farber's presentation serves further to emphasize the importance of hypertensive ischemic ulcers of the leg.

Ulcer of the leg is not a fatal disease, but it may be incapacitating; and the loss of time, of both patient and physician, represents a serious economic burden. The very fact that leg ulcers are so frequently encountered has militated against careful study of them.

I am not prepared to accept the term "hypertensive ischemic leg ulcers" as an etiological diagnosis, chiefly because I do not feel that hypertension itself is anything more than a sign or a symptom of an underlying cardiovascular condition. But possibly this is just quibbling. The advantage of appending a name to some clinical condition rests in the fact that cases which fit into a certain category can be set aside for more intensive study. The disadvantage, however, is that as soon as a condition has been given a name it is thought to be understood, and the physician's interest may be stultified in that he can say to himself, "Oh, yes, this is a hypertensive ischemic leg ulcer."

There is just one question I should like to ask: Why do these ulcers appear only in the lower extremities? The circulation of blood is dependent upon the establishment of a gradient of pressure from the arterial to the venous side of the capillary network. Manifestly, in these patients whom Dr. Farber has described there is evidence of structural impairment of arterial supply. However, I believe more careful search should be made for evidences of impairment of venous return. Even though the patients gave no history of thrombophlebitis, had no varicose veins, and had little or no edema, I do not believe that the question of impairment of venous return has been ruled out. Careful studies by phlebography have often demonstrated the presence of deep venous occlusion or incompetent valves of the communicating veins of the legs in patients who have given no history of thrombophlebitis. Bauer of Sweden has demonstrated by venography how often even mild trauma to the lower extremities results in venous thrombosis. This venous thrombosis may be entirely unrecognized, both by the patient and by the physician, and yet, years later, may be followed by post-thrombotic sequelae.

Another point of interest is the degree of vasoconstriction which may for years have preceded the development of these leg ulcers. It is well known that prolonged vasoconstriction, as in Raynaud's disease, ultimately will lead to organic arterial obliteration of the smaller blood vessels. The ulcers of the leg in patients with livedo reticularis demonstrate, on histological study, lesions involving both the arteries and veins not unlike those which Dr. Farber has described.

Some Aspects of the Management of Bilateral Calculus Disease of the Kidney

R. H. Flocks, M.D., *Iowa City, Iowa*

SUMMARY

In the diagnosis of bilateral calculus disease of the kidneys, it is important to differentiate between cystine, uric acid, calcium oxalate and phosphate renal lithiasis. Methods for distinguishing one from another are described.

Dietary therapy is the method of choice for cystine and uric acid lithiasis.

In calcium and phosphate urolithiasis, dietary therapy is a very useful adjunct. It must be regulated by careful studies of its effect on urinary calcium precipitability, a new test for which is described based upon the demonstration of the existence of two forms of calcium in the urine.

Irrigation therapy for calcium phosphate and phosphate lithiasis is briefly discussed.

Surgical therapy for large renal phosphatic calculi is discussed to show how considerations of renal counterbalance and urinary calcium, magnesium and phosphate excretion through damaged kidney substances influence the surgical plan in each case.

THE management of patients with bilateral urinary calculi, or with a history of having had calculi coming from both kidneys, presents many difficult problems. Once the diagnosis has been made, several questions of treatment present themselves: When, if, and how to operate; when and if to use irrigation treatment; when and what type of general medical and dietary therapy to institute. The objective of all such treatment is to return the urinary tract to as near normal as possible and prevent recurrent stone formation. In order to attain this objective the presence or absence of hyperexcretion of the stone-forming crystalloids, the precipitability of these crystalloids, and the presence or absence of urinary stasis and infection must be ascertained and evaluated in each case.

In order to evaluate the question of hyperexcretion and precipitability of the stone-forming crystalloids in a particular case, it is first necessary to determine the chemical composition of the stones that are present. Table 1 illustrates the chemical composition of urinary calculi as described by Prien and Frondel[12] in the crystallographic studies of urinary calculi. Although these studies are extremely important from a research point of view, from the practical point of view they thus far do not differ from the ordinary chemical classification such as described by McIntosh[11] and illustrated in Table 2. This classification divides urinary calculi into five types—the cystine, the uric acid, the calcium oxalate, the calcium phosphate, and the magnesium ammonium phosphate stones. Rare calculi such as the xanthine calculi and calculi associated with sulfonamide administration are not considered here. The determination of the chemical composition of the calculi in question is made by the clinical and x-ray features to be described later in this presentation, and by the actual chemical and physical properties of the stone when this is obtained by methods described elsewhere.

The most important factor in the pathogenesis of cystine lithiasis is hyperexcretion of the stone-forming crystalloids. Unless that defect of intermediary metabolism which is associated with an inability to complete the breakdown of cystine is present, hyperexcretion of this crystalloid in the urine does not occur and cystine calculi do not form. Therefore, it is possible to make a diagnosis

Table 1.—*Crystalline Component of Urinary Calculi* (Prien and Frondel)

Substance	Mineralogical Name
Calcium oxalate monohydrate	Whewellite
Calcium oxalate dihydrate	Wheddellite
Magnesium ammonium phosphate hexahydrate	Struvite
Carbon-apatite	Carbonate-apatite
Hydroxyl-apatite	Hydroxyl-apatite
Calcium hydrogen phosphate dihydrate	Brushite
Uric acid	
Cystine	
Sodium acid urate	
Tricalcium phosphate	Whetlockite

Table 2.—*The Classification of Renal Calculi According to Chemical Pathogenesis*

1. Uric acid
2. Cystine
3. Primary calcium stones without infection
   - Oxalate
   - Phosphatic
   - Carbonic
4. Magnesium stones—urea splitting organisms.
   - P. Ammoniae
   - P. Morgani
   - Staphylococcus
   - E. coli

Professor, Department of Urology, College of Medicine, State University of Iowa, Iowa City, Iowa.

Presented before the Section on Urology at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

of cystine lithiasis by studying the urinary output of cystine. The normal amount in a 24-hour specimen of urine is 10 to 15 mg. In cases of cystine lithiasis this value may go up to 400 to 1,000 mg. per 24 hours. A test for cystine that can be done in the ordinary clinical laboratory is outlined in Table 3. Thus, if the amounts in the urine are very small, cystine stone cannot be present; if the amounts are large the probabilities are that the stone in question is a cystine stone.

TABLE 3.—*Technique for Testing for Cystine in Urine*

To 5 cc. urine made alkaline with ammonium hydroxide, 2 cc. of 5 per cent sodium cyanide solution is added and allowed to stand for from 5 to 10 minutes. A few drops of a freshly prepared 5 per cent sodium nitroprusside solution is then added. In the presence of cystine, a permanent deep purplish red color develops.

Cystine lithiasis presents other features which are quite characteristic; infection is usually absent, the urine is acid, the stones grow rather rapidly, and, therefore, when they finally become manifest are large and usually coraliform. They are moderately opaque to the x-ray, presenting a rather homogeneous appearance on the film. Grossly they appear crystalline and of a greenish-yellow color. If a diagnosis of cystine lithiasis is established, every effort should be made to avoid surgical treatment, since the defect in metabolism cannot be corrected and surgical removal, therefore, will only lead to recurrent stone formation unless meticulous medical management is instituted. Operation should not be done unless the stone is producing obstruction and infection to the urinary passageways which makes such treatment exigent. The medical management consists of placing the patient on an alkaline ash, low protein diet, and supplementing this diet with sodium bicarbonate in large enough doses to keep the urine persistently of a pH between 7.0 and 8.0. Infection and urinary stasis should be corrected, if at all possible. Such treatment when meticulously carried out will produce satisfactory results.

In contrast to cystine lithiasis, there are three important factors in the pathogenesis of uric acid stones. These are (1) hyperexcretion of the stone-forming crystalloid in patients who have a defect in uric acid metabolism, (2) a persistently acid urine, and (3) the presence of a nucleus upon which the uric acid stone may form. Without hyperexcretion of the uric acid, uric acid stone may still form if the other two factors are present. In some cases of gout, uric acid stone may form without hyperexcretion of uric acid in the urine. In order to rule out defective metabolism, studies of uric acid content in the blood are of importance. The normal value is between 3 and 4 mg. per 100 cc. of blood. In gout the uric acid content may run as high as 8 mg. per 100 cc.

Uric acid stones, in contrast to cystine stones, are non-opaque to the x-ray so that they are recognized by a filling defect in the pyelogram and not by an opacity on the plain film. Moreover, as they grow very slowly and usually produce pain and hematuria in the early stages of formation, the attention of the patient as well as the physician is drawn to the urinary tract before the stones have become very large. Therefore, they frequently are first noted by the patient and the physician when they are passing down the ureter.

A coraliform stone built up from uric acid, although rare, can occur. Characteristically, then, uric acid lithiasis will present the following features: Clinical symptoms in the presence of a small stone which is non-opaque to the x-ray with an uninfected, highly acid urine. In many of these cases the uric acid content of the blood is high. Here, as in the case of cystine lithiasis, operation should be avoided. Usually the stone will pass spontaneously or with manipulation. Recurrent stone formation will be reduced tremendously by placing the patient on a low purine, alkaline ash diet supplemented by large enough doses of bicarbonate to keep the uric acid in solution and to keep the pH of the urine between 7.0 and 8.0. All factors which may produce a nucleus should be cleared up, if possible, since dissolution of fairly large stones has not been accomplished; in the author's experience those stones which have not passed spontaneously have to be removed by surgical means. However, it is to be emphasized that such operations are only incidental in the management of patients with stones of that kind.

If the stones do not fall into the uric acid and cystine group but are definitely in the oxalate or phosphatic group, the situation is different. Although hyperexcretion of the stone-forming crystalloids is not infrequent as a primary cause of these stones, persistent hyperexcretion of calcium is rare. The most important condition in which this occurs in association with renal calculi is hyperparathyroidism. If hyperparathyroidism is present, this can usually be determined definitely by blood chemical and urinary calcium studies (Table 4). If it is present, then the condition should be taken care of first before anything is done about the calculi (Figure 1). If the calculi have been formed due to other factors such as hyperexcretion during a period of recumbency, or infection and stasis, or causes which at present are not well understood, then the treatment becomes one of attention to those details which at present are thought to be connected with the formation of calculi of this type (Table 5).

Calcium oxalate stones when they occur alone do not usually form large coraliform stones. The urine is not usually infected and is usually neutral in pH. The stones are radiopaque and have a characteristic serrated appearance. The cause of such stones is not completely known. The treatment is removal. In many cases they will pass spontaneously because of their small size. The preventive treatment consists of forcing fluids, avoiding infection and stasis in the urinary tract, and dietary management.

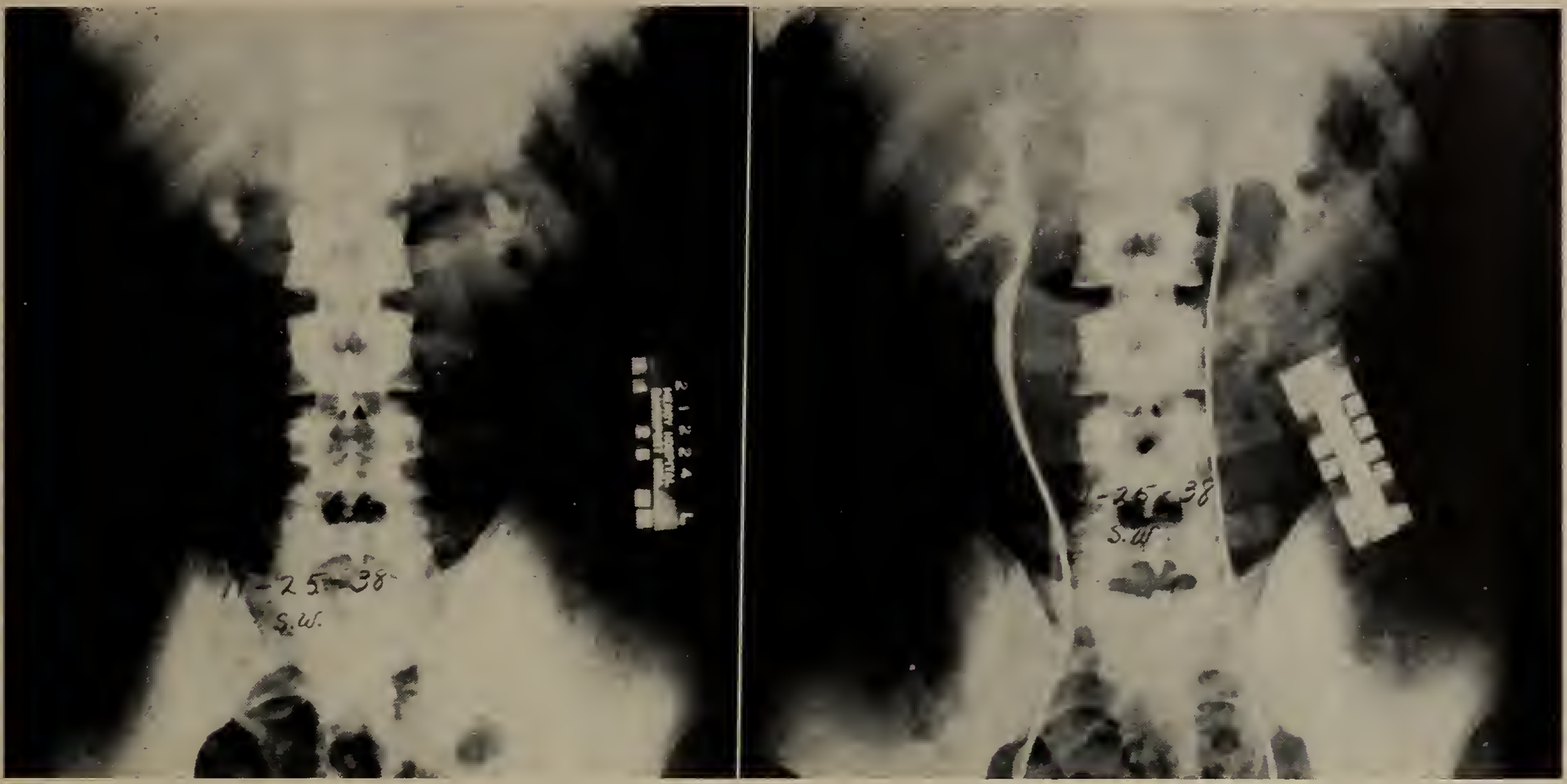


Figure 1.—Plain film and retrograde pyelograms in a patient who had absolutely no evidence of bone changes or bone symptoms and who consulted a physician simply because of pyuria. Examination showed the presence of bilateral renal calculi, blood calcium of 13.7 mg. per 100 cc., and blood phosphorus of 2.7 mg. per 100 cc. These are the typical blood findings in hyperparathyroidism. In addition the patient had a urinary calcium output of over 600 mg. per 24 hours. The parathyroid glands were explored and an adenoma found and removed. Following this, under general care for infection and on dietary therapy for phosphate calculi, the urinary calculi disappeared.

TABLE 4.—*Urinary Calcium Excretion for Twenty-four Hours After Different Conditions*

Condition	Urinary Calcium, mg.
1. Normal individual	200±
2. Body immobilization	350-450
3. Bone disease:	
First few days	Normal or high?
Early weeks	300-450
Late years	100-450
4. Pronounced renal damage	30-60
5. Endocrine disturbances:	
Hyperparathyroidism	350-550†
Hyperthyroidism	Normal* or high
Hyperpituitary function	Normal* or high
6. "Idiopathic" high urinary calcium; 50 to 66 per cent of patients with calcium stones. Not due to difference of absorption	300-500

* Leriche.

† The blood serum calcium in hyperparathyroidism before renal insufficiency occurs is elevated above 11 mg. per cent and the serum phosphorus is lowered below 3 mg. per cent. The phosphatase is high.

TABLE 5.—*Conditions Predisposing to Calcium Urolithiasis*

1. Disease producing prolonged immobilization of the body
   a. Fractures of the spine or extremities associated with prolonged immobilization of large bones.
   b. Chronic osteomyelitis.
   c. Chronic arthritis, or other bone joint disease, producing immobilization of large portions of the skeleton.
   d. Neurologic damage as a result of trauma or disease producing prolonged immobilization.
   e. Chronic visceral disease requiring prolonged recumbency.
2. Changes in the urinary organs
   a. Congenital anomalies associated with stasis.
   b. Acquired obstructions—stricture of urethra, etc.
   c. Paralysis of urinary passageway.
   d. Introduction of infection into urinary tract.
   e. Foreign body in urinary passageway.
3. Endocrinopathies
   a. Hyperparathyroidism
   b. Hyperthyroidism?*
   c. Hyperpituitary disease?*
4. Focus of infection elsewhere in body?*
5. Vitamin deficiency or excess
   a. Vitamin A deficiency?*
   b. Vitamin D excess
6. Metabolic abnormalities
   a. Idiopathic hypercalcinuria
   b. Changes in colloids?*

* Note: Conditions with question mark are included mainly upon a theoretical basis. Others are included upon a clinical basis.

With regard to dietary management, the important work of Hammersten[7, 8] of Sweden must be emphasized. She showed that the solubility of calcium oxalate is very definitely influenced by the presence of the magnesium ions (Table 6). For example, if a few cubic centimeters of the Sulkowitch reagent* is added to a specimen of urine to precipitate the calcium as calcium oxalate, a heavy cloud of precipitate occurs if there is a fair amount of calcium in the urine. If, on the other hand, a few cubic centimeters of magnesium sulfate is added to the urine prior to the addition of the Sulkowitch reagent, no precipitate or a much more slowly forming and less dense precipitate occurs, the variation depending upon the original concentration of the calcium and the amount of magnesium sulfate which has been added. Moreover, Hammersten showed that a quantitatively and qualitatively adequate diet with a good supply of calcium, magnesium, and phosphorus in well-balanced proportions and in easily resorbable form, does not give rise to calculi in the urinary passageways of rats. After producing urinary stones, which were either calcium oxalate or calcium phosphate stone, by means of an inadequate diet (a diet which contained inadequate amounts of magnesium and excesses of oxalic acid), Hammersten gave the fully adequate diet for therapeutic purposes. Of 64 stones which were demonstrated radiologically in the experimental animals, 40 per cent decalcified. This emphasized the importance of a diet adequate in magnesium, calcium, and phosphorus in preventing the formation of oxalate calculi. Hammersten showed that in animals given inadequate amounts of both calcium and magnesium, the urinary calcium became elevated and it was apparently upon this basis that the stones formed. It may very well be, therefore, that lack of adequate magnesium intake might explain hypercalcinuria in cases in which the disease cannot be ascribed to recumbency or definite abnormality of the calcium metabolism. It has also been indicated (Burkland[3]) that a diet low in oxalates and high in vitamin B complex is of importance in decreasing available oxalate in cases of oxalate calculi. Diets adequate in calcium and magnesium and other vitamins and low in oxalate may be worked out on the basis of information given in Table 7.

---

* Sulkowitch reagent: Ammonium oxalate, 2.5 gm.; oxalic acid, 2.5 gm.; glacial acetic acid, 5 cc.; distilled water q.s., 250 cc.

With regard to the dietary management for the prevention of the recurrence of both oxalate and calcium phosphate stones, studies of the precipitability of the urinary calcium are of importance, for only by such means can one gain information with regard to the efficacy of the regimen prescribed for the patient. Studies by the author[4, 5, 6] along these lines have previously been reported. (See Figure 2 and Table 8.) Further studies now in progress and the work of Shorr,[13] Scott, and others would seem to indicate that one of the ways that nature has for maintaining the calcium salts in solution in the urine is not only the neutral salt effect but the formation of some sort of complex ion leaving only a proportion of the calcium in the free ionized state. It is the latter which is free to form the insoluble oxalate and phosphate salts and precipitate as illustrated in Figure 3. That urine contains calcium in two such forms—one the ionized on the positive side, and the other the non-ionized or in the form of a complex anion—has been demonstrated in the laboratory at the University of Iowa College of Medicine by experiments of two types: (1) elec-

Table 6.—*Solubility of the Different Forms of Calcium Oxalate in Water and in Urine with Magnesium* (Hammersten):

	Monohydrate	Dihydrate	Trihydrate
Water 37°	$3x10^{-9}$	$9x10^{-9}$	$27x10^{-9}$
Urine saline solution with magnesium content of 0.01 mol. 37°	$196x10^{-9}$	$600x10^{-9}$	$1{,}800x10^{-9}$

Table 7.—*Diet for Patients with Oxalate Stone*

Omit: Cocoa; chocolate; pepper and other spices; spinach; chicory; string beans; green beans; beets; potatoes; gooseberries; rhubarb.

Use: Fruits: apples, apricots, peaches, pears, melons.
Vegetables: carrots, celery, peas, turnips, asparagus, lettuce, cabbage, cauliflower, cucumbers.
Use white bread.

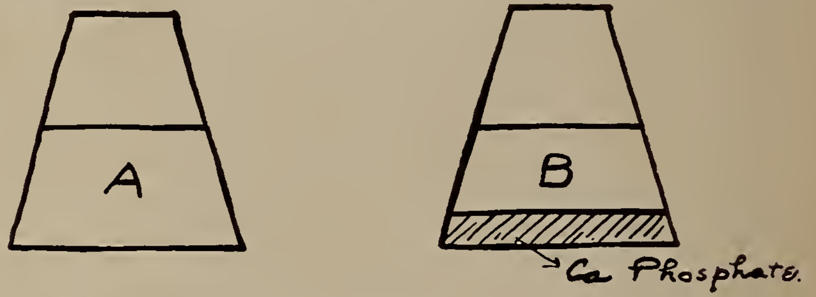


Figure 2.—Calcium precipitability. Concentration of calcium in *B* minus concentration of calcium in *A* equals calcium precipitability. *Method:* 100 cc. of freshly voided urine is obtained, and immediately divided into two portions after the pH has been determined. In one the concentration of calcium is obtained. The other is immediately thoroughly mixed with 1 gm. of finely divided calcium phosphate for 10 minutes and filtered, and then the calcium concentration is obtained. The two concentrations are then compared. The urinary calcium precipitability as determined by this method is then expressed as minus the milligrams of calcium which will precipitate from the urine when it is mixed with calcium phosphate as just described. By this definition, a minus value indicates that calcium will precipitate from the urine under these conditions and a positive value indicates that calcium phosphate will dissolve in the urine under these conditions.

Table 8.—*Urinary Calcium Precipitability with Regard to Calcium Phosphate in a 19-Year-Old White Male*

Condition of Activity	Diet	Daily Urinary Calcium Excretion, mg.	pH of Urine	Concentration of Calcium, mg. %	Concentration after Ten Minutes Mixing Calcium Phosphate, mg. %	Precipitability
Normal	High calcium	380	6.0	39	29	—10
Immobilized 7 days	High calcium	690	6.0	42	8	—34
6 days after immobilization	High calcium	450	5.5	27	21	— 6
Normal	Low calcium	170	6.0	21	17	— 4
Normal	Basic ash	284	6.0	14	10	— 4

Note the influence of immobilization both upon the 24-hour urinary calcium and upon the precipitability; the latter is tremendously increased. Note that when activity is normal, precipitability is within normal limits, irrespective of diet or pH of urine when the latter does not vary within wide limits.

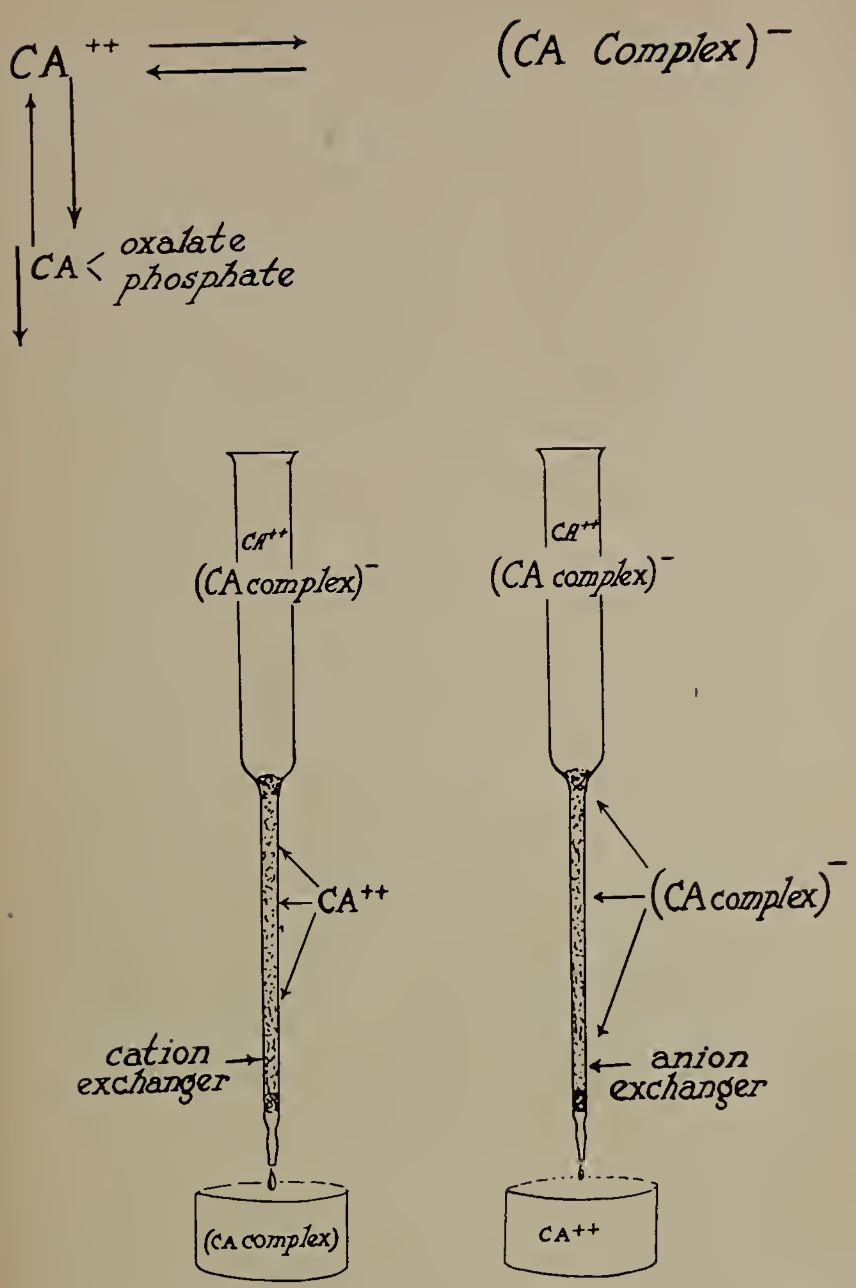


Figure 3.—Ion exchangers being used for the determination of the different types of calcium in urine. The theoretical chemical situation involved is illustrated also.

trolysis; and (2) experiments with adsorbing resins. By means of the latter, quantitative estimates of each form of calcium in a given specimen of urine can be made. For example, if a solution of calcium chloride which contains 20 mg. of calcium per 100 cc. should be subjected to a cation resin exchanger for 15 minutes, it would be found that the calcium had been completely removed from the solution. If the solution then were tested with the Sulkowitch[1, 2] reagent, no precipitate of calcium oxalate would occur. On the other hand, if urine in which the calcium precipitability is low were subjected to the same procedure, a very definite precipitate of calcium oxalate would occur upon the addition of the oxalate reagent. The reason for this is that the solubility of the calcium oxalate is so low that it will pick up calcium ion in very low concentration and thus reverse the equilibrium between the calcium ion and the calcium complex in the urine—something which the ion exchanger (adsorbing resin) cannot do as easily. An estimate of the percentage of calcium in the free ionized state in the urine may be obtained by noting the difference between the amount of precipitate before and after the urine has been subjected to the action of the cation exchanger. From this the quantity or concentration of calcium ion available for precipitation may be estimated. Similarly, by the use of an anion adsorbing resin the amount of calcium tied up as a negative complex can be estimated. Assuming, then, that that portion of the calcium in the urine which is in the ionized state is the portion which is available for precipitation to form a stone or precipitate upon a stone, the test outlined can be used clinically to aid in estimating the efficacy of any regimen which we may prescribe to prevent the recurrence of calcium stones in any particular case. Such urinary calcium studies, under many different conditions, are now in progress in the laboratory of the University of Iowa College of Medicine.

Small calcium phosphate stones present essentially the same problems as do calcium oxalate stones. However, it is much easier to induce breakdown and passage of small calcium phosphate stones by means of general medical management that it is to achieve the same result with regard to calcium oxalate stones. This is because the creating of an acid urine of low calcium precipitability in cases in which there is no infection will have a much greater effect upon a stone formed from calcium phosphate than it will upon a calcium oxalate calculus. Calcium phosphate stones can usually be differentiated from oxalate stones by x-ray characteristics: The former are not serrated and the opacity is denser and more homogeneous.

In dealing with large phosphatic calculi, there are three types of therapy, any one or combination of which may be appropriate in the individual patient. These are (1) dietary regimen;[9] (2) irrigation therapy[14] and (3) surgical therapy.

Prerequisite to the use of dietary treatment is control of infection. Large doses of penicillin (at times 100,000 units intramuscularly every two hours for five days) should be used first, and if this is unsuccessful other drugs such as sulfacetamide, sulfadiazine, streptomycin, etc., may be necessary. The Higgins acid ash diet supplemented with vitamin A is the dietary regimen of choice. (Regular and frequent determination of the pH and calcium precipitability of the urine is extremely important in order to make certain that the regimen is having the desired effect upon the urine.) This type of therapy is indicated in cases in which the stones have the characteristics of early calcium urolithiasis, in which infection is absent or can be controlled, in which there are general contraindications to surgical treatment, and as an adjunct to other types of therapy for the prevention of recurrence.

Irrigation therapy through a urethral catheter with either Suby's solution or a similar solution* may also be used for patients with early calcium urolithiasis. The danger is introduction of infection. In those rare cases in which the stone is almost "sand-like" in character, very good results can be obtained by this method. The most frequent use of irrigation therapy, however, is an adjunct to surgical removal of large coraliform or multiple calculi. In cases in which fragments or small stones have been left behind in the renal pelvis or severe infection is present, postoperative intermittent or continuous irrigation of the renal pelvis through a nephrostomy tube in conjunction with intensive anti-infection therapy and a diet to create a urine of low calcium precipitability produces excellent results. The forcing of fluids with the creating of a 24-hour urinary output of at least 2,500 cc. is really a form of irrigation treatment and is essential in all medical management of renal lithiasis. By this means small precipitates are washed out and cannot become nuclei for further stone formation. Moreover, the medium surrounding a stone is kept as free as possible of stone-forming crystalloid.

---

* Irrigating solution: Citric acid (monohydrous), 32.3 gm.; magnesium oxide (anhydrous), 3.8 gm.; sodium carbonate (anhydrous), 4.4 gm.; distilled water q.s., 1,000 cc. If the solution has an irritating effect, this may be diminished by changing the ratio of acid to sodium carbonate to raise the pH.

Operation is indicated in the treatment of patients with large phosphatic calculi if infection is present and it appears that complete removal of the stone, or stones, is possible either by operation alone or by operation in combination with irrigation through a nephrostomy tube. Great multiplicity of calculi or involvement of the renal pyramids contraindicates surgical treatment. If operation is done, it should be directed not only at the removal of the stone but also at the correction of stasis of any portion of the urinary passageway. This is absolutely necessary if recurrence of calculi is to be avoided.

In this connection, attention may be called to studies on urinary calcium and magnesium excretion from damaged kidneys[4] (see Figure 4). These studies indicated that if an entire kidney is uniformly damaged, the urinary calcium and magnesium and urinary phosphate are so decreased that, unless pronounced stasis and infection are present, the chances of a new stone's forming are very slight. On the other hand, if only one calyx or one small group of calices are damaged, stasis and infection plus the entrance of normal urinary calcium and phosphorus from that portion of the kidney which is normal into the damaged portion of the kidney pelvis would predispose to recurrence of stone formation. This—in addition to the predisposition to infection—is the reason for calicectomy in such cases (See Figure 5).

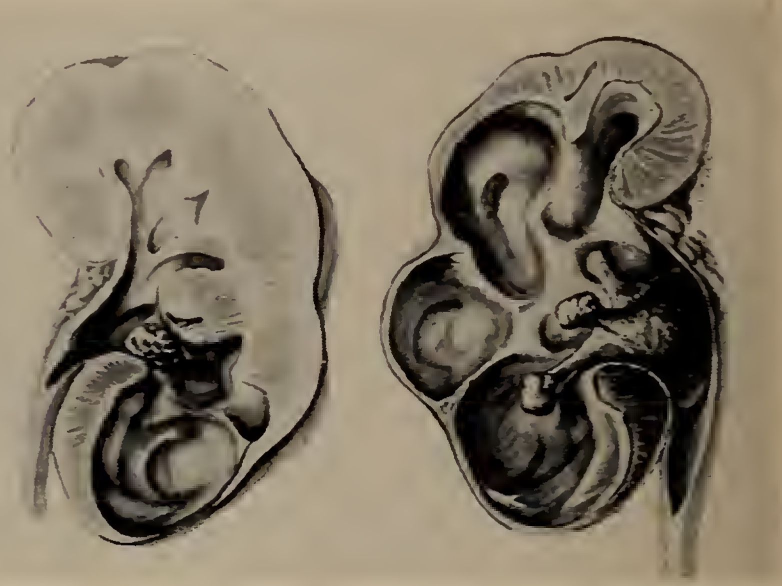


Figure 5.—Diagrammatic drawings of kidney pelvis and kidney substance to show how a kidney symmetrically damaged, as in the drawing at left, would excrete little calcium and phosphorus and, therefore, be less prone to form a recurrent stone than the one as illustrated in the drawing at the right, where, since most of the kidney substance is normal, there is plenty of the stone-forming crystalloid by stasis in the involved calyx predisposing to infection and precipitation in that area. Calicectomy should be done in such an instance.

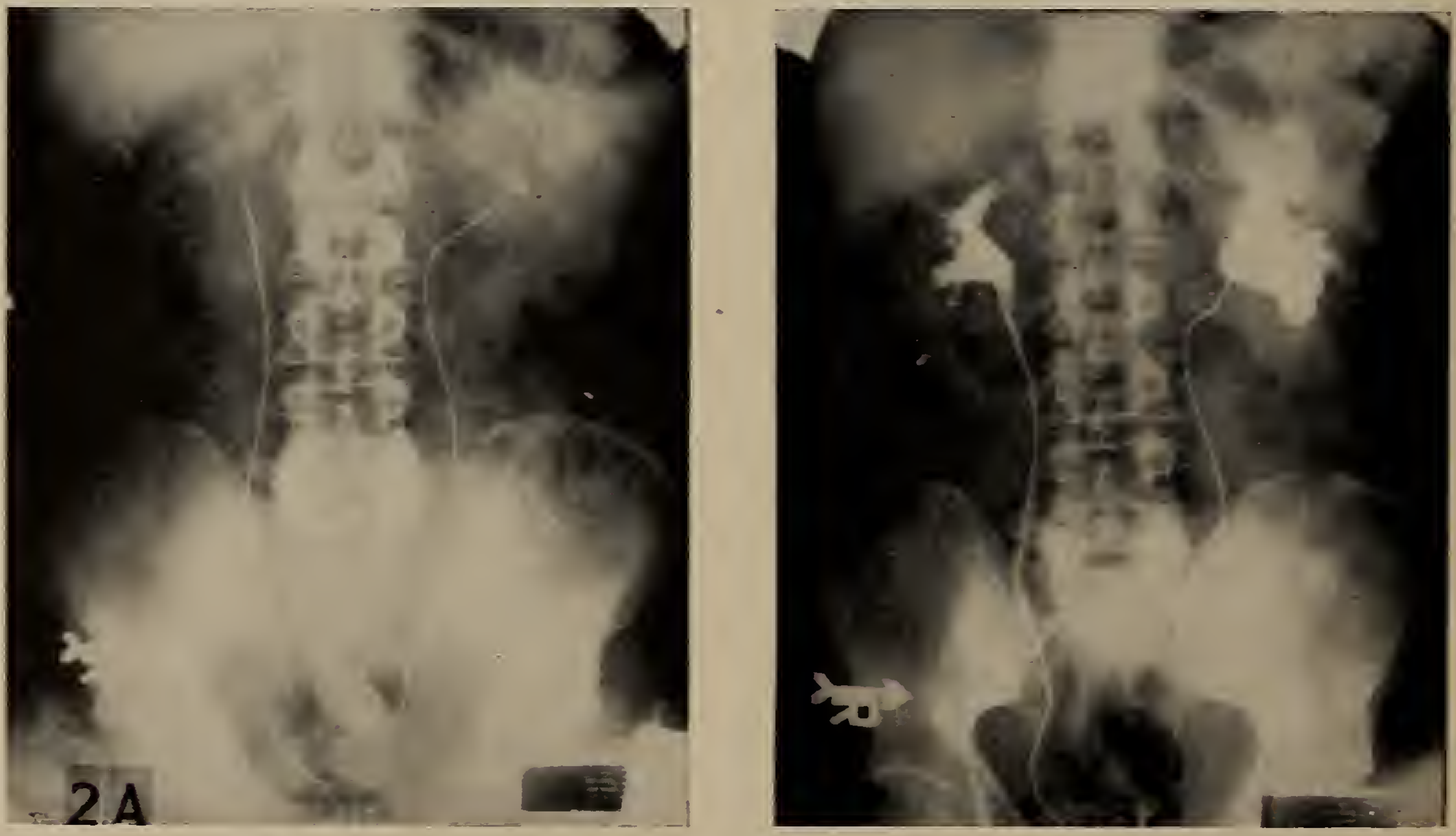


Figure 4.—The plain film and retrograde pyelogram of a patient who had hydronephrosis on the left side with very poor function of the left kidney. Differential studies of calcium magnesium and phosphorus were made. These showed, on the right side, 13.8, 12.3, and 40.0 milligrams per cent: on the left, 3.0, 12.5, and 1.5 milligrams per cent respectively. This illustrates the effect of damaged renal substance upon the excretion of calcium and phosphorus.

It is also necessary, when operation for removal of bilateral and unilateral coral calculi is being planned, to consider the influence of renal counterbalance. When one kidney is normal and there is no metabolic condition which might predispose to recurrent stone, it is more satisfactory to do a nephrectomy for coral calculus than to remove the stone itself. This is because, according to the theory of renal counterbalance (which has been frequently confirmed in the author's experience) even though the stone is completely removed and no recurrent stone forms, there will be progressive atrophy of the kidney. On the other hand, if the alternate kidney is damaged also, the kidney operated upon improves following the removal of the stone; but the danger of recurrent calculus is much greater, because as the kidney function improves the calcium and phosphate excretion through that kidney improves, so that the quantity of crystalloids becomes high enough to produce stone if other factors are favorable. In such cases it is extremely important to eliminate infection by the use of antibiotics and appropriate sulfonamides and to eliminate stasis by whatever surgical or medical procedure is necessary. It is preferable also in the case of bilateral renal calculi, when conservative procedures are planned and nephrectomy cannot be considered, to operate upon the poorer side first. If the better side is operated upon first, that kidney will come back to practically normal and nephrectomy then may be necessary on the other side, since the function on the bad side may not return because of the counterbalance effect.

REFERENCES

1. Albright, F., Sulkowitch, H. W., and Chute, R.: Nonsurgical aspects of kidney stone problem, Jour. Am. Med. Assn., 113:2049-2053, December 2, 1939.

2. Barney, J. D., and Sulkowitch, H. W.: Progress in management of urinary calculi, Jour. Urol., 37:746-762, June 1937.

3. Burkland, C. E.: Dietary and occupational considerations in the treatment of urogenital disorders, Urol. & Cutaneous Review, 530:25-30, 1949.

4. Flocks, R. H.: Calcium and phosphorus excretion in urine of patients with renal or ureteral calculi: Therapeutic and etiologic considerations, Jour. Am. Med. Assn., 113: 1466-1471, October 14, 1939.

5. Flocks, R. H.: Urinary calcium precipitability in medical management of calcium urolithiasis, Jour. Urol., 45: 721-726, May 1941.

6. Flocks, R. H.: Prophylaxis and medical management of calcium urolithiasis: Role of quantity and precipitability of urinary calcium, Jour. Urol., 44:183-190, August 1940.

7. Hammersten, G.: Dietetic treatment of calculi, Nord. Med., 31:1567-1570, July 19, 1946.

8. Hammersten, G.: Formation of aseptic stones, Nord. Med., 30:911-918, April 18, 1946.

9. Higgins, C. C.: Production and solution of urinary calculi; experimental and clinical studies, Jour. Am. Med. Assn., 104:1296-1299, April 13, 1935.

10. Hodge, I. F., Hayllar, B. L., and Way, R. A.: A new series of citrate buffers for use in urinary tract lithiasis, J. Urol., 48:204-206, 1942.

11. McIntosh, J. F.: The classification and chemical pathogenesis of urinary calculi, J. Clin. Invest., 21:755-761, 1942.

12. Prien, E. L., and Frondel, C.: Studies in urolithiasis; composition of urinary calculi, J. Urol., 57:949-994, June 1947.

13. Shorr, E.: Possible usefulness of estrogens and aluminum hydroxide gels in management of renal stone, J. Urol., 53:507-520, April 1945.

14. Suby, H. I., Suby, R. M., and Albright, F.: Properties of organic acid solutions which determine their irritability to the bladder mucous membrane and the effect of magnesium ions in overcoming this irritability, J. Urol., 48:549-559, 1942.

◆

The Excretion of Digitoxin

René Bine, Jr., M.D., Meyer Friedman, M.D., and Sanford O.
Byers, Ph.D., *San Francisco*

SUMMARY

By noting the reaction of embryonic duck hearts to solutions containing digitoxin, it is possible to detect as little as 2 micrograms of digitoxin in 24-hour urine samples of rats and of human subjects.

Rats were given large doses of digitoxin intraperitoneally and their 24-hour urine production collected. A minimal quantity of digitoxin was detected in the urine. A minimal quantity of digitoxin was detected in the first three 24-hour urine samples of human subjects given 1.2 mg. of digitoxin. These results show that by this method the measurable urinary excretion of digitoxin in the rat and in human subjects is small.

EXACT quantitative information concerning the absorption and excretion (or destruction) of digitalis glycosides in the human body is still to be obtained. Primarily this is because there is as yet no test sufficiently sensitive to detect the relatively minute amounts of digitalis glycoside which must be present in the tissues and body fluids of patients receiving digitalis.

In previous studies[1,2,3] extremely minute amounts of the digitalis glycosides Lanatoside C and digitoxin were detected in Tyrode's solution, rat serum, and human serum. Moreover, it was possible to measure the rate of disappearance of the digitalis glycoside (Lanatoside C) from the bloodstream of man after intravenous injection.

Prior to these studies it had not been possible to measure in any quantitative fashion the actual renal excretion of digitalis glycosides, although it has been stated for many years on the basis of work by Hatcher and Eggleston[4] in 1912 and 1919 that only a small fraction of any cardiac glycoside is excreted in the urine.

By means of the embryonic duck heart method it has been possible to measure, in a quantitative fashion, minute amounts of digitoxin in the 24-hour urine volumes of rats and of human subjects.

EMBRYONIC DUCK HEART METHOD

Briefly, the method used to set up the embryonic duck heart preparation consists of incubating fertile duck eggs at 39° C. for approximately 88 hours. The embryo, after it is removed in toto from within the vascular sinus in the egg, is suspended in Tyrode's solution on a slide and placed under a dissecting microscope. With the aid of cataract knives, the heart is teased free from the remainder of the fetal body. When six such hearts are thus dissected they are transferred, by floating them gently upon a small spatula, to a second slide well. This slide contains 0.5 ml. of the solution to be tested and rests on the stage of a compound microscope which is contained in a box automatically maintained at 35° C. After this final transfer the hearts are ready to be observed.

This particular biologic preparation reacts to the presence of sufficient digitoxin by the exhibition of increased rate of beating, hypertonic contractility, auriculoventricular block, missed beats, or finally, cessation of beating. The time of appearance of arrhythmia, usually manifested as auriculoventricular block or missed beats, is quantitatively commensurate with the concentration of digitoxin present.

As is shown in Table 1 the embryonic heart preparation reacted to the presence of 0.005 micrograms of digitoxin in 1 ml. of Tyrode's solution, whereas only quantities of 0.2 micrograms or more of digitoxin per ml. could be detected in rat serum and only quantities of 0.6 micrograms or more of digitoxin per ml. could be detected in human serum.

DETECTION OF DIGITOXIN IN URINE

The same method was applied for the detection of digitoxin in extracts of urine samples both of the rats and of human subjects. Because of the toxicity of urine as such, the problem of removing digitoxin alone without various toxic factors of urine from these samples was considerable.

Table 1.—*The Detection of Digitoxin in (1) Tyrode's Solution, (2) Rat Serum, and (3) Human Serum by the Embryonic Duck Heart Preparation.*

	AVERAGE TIME "DIGITALIS EFFECT" (MINUTES)		
Concentration of Digitoxin (Micrograms per cc.)	Tyrode's Solution	Rat Serum	Human Serum
.001	ND*	ND*	ND*
.005	48	ND	ND
.010	41	ND	ND
.05	23	ND	ND
.10	12	ND	ND
.20	—	62	ND
.40	—	38	ND
.60	6	24	49
.80	—	21	34
1.00	4	11	21

* ND indicates that no glycoside could be detected by occurrence of "digitalis effect" in embryonic heart preparation.

This study was aided by grants from the Life Insurance Medical Research Fund, the U. S. Public Health Service, and the Sandoz Chemical Works.

Presented as part of a symposium on Heart Disorders arranged jointly by the Section on General Medicine and the Medical Division of the California Heart Association at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

The volume that must be dealt with in testing human urine as compared to rat urine necessitates the employment of slightly different methods.

EXTRACTION FROM RAT URINE

The method of extraction of digitoxin from rat urine consists essentially of evaporation of the urine sample to dryness, extraction with chloroform, and evaporation of the latter. The chloroform residue is extracted with alcohol which in turn is added to water and the solution is then repeatedly boiled to rid it of alcohol. The final aqueous solution boiled down to 1 ml. is then diluted with 59 ml. of Tyrode's solution to make a final solution of 60 ml. This relatively large quantity is used to eliminate the effect on the duck hearts of certain toxic factors of urine which, although they cannot be wholly eliminated, can be diluted. This dilution factor must be taken into account when comparing the figures obtained in standardization of the effect of digitoxin in urine and in Tyrode's solution.

PROCEDURE

Embryonic duck hearts were exposed to this latter solution and the time of "digitalis effect" (i.e., auriculoventricular block or missed beats) observed and the quantity of digitoxin estimated according to previously described methods.[2, 3] It was thus found possible to detect as well as measure as little as 2 micrograms of digitoxin added to the 24-hour urine samples of rats. A quantitative differentiation could be made between urine samples containing different quantities of added digitoxin (Table 2).

Nine albino rats (average weight 165 gm.) were given 0.1 microgram of digitoxin per gm. of body weight by intraperitoneal injection, and their urine was collected for 24 hours. The urine samples of five of these rats were also collected on the second and third day following injection. Ten rats (average weight 218 gm.) were given 1.0 microgram of digitoxin per gm. of body weight by intraperitoneal injection and similar urine collections were made during the first 24 hours. Urine collections of eight of these rats also were made on the second and third days following injection. All urine samples were extracted and tested on the duck hearts by the method described.

RESULTS

The injection of a moderately large amount of digitoxin (i.e., 0.1 microgram per gram) as shown in Table 3, into ten rats was not followed by the appearance of detectable digitoxin in the 24-hour samples of urine of any of the rats either 24, 48, or 72 hours after injection. In view of the fact that each rat actually received approximately 16.5 micrograms of digitoxin, absence of as much as 1 microgram of digitoxin in the urine indicated that little or no free digitoxin as measured by this method was excreted by the kidneys of these rats.

However, the urine samples (shown in Table 4) collected during the first 24 hours from the ten rats that had received ten times the above amount of digitoxin (i.e., 1.0 microgram per gram) contained an average of 7.4 micrograms of digitoxin (range: 3.3 to 10 micrograms). However, none of the urine samples collected during the second and third days after injection contained a detectable amount of digitoxin (i.e., less than 1 microgram).

Thus, even in these rats which had received a relatively large amount of digitoxin (average 218 micrograms) the average renal excretion of free digitoxin, as measured by this method, of only 7.4 micrograms (less than 3.5 per cent of the administered dose) again indicates that the renal excretion of digitoxin in the rat, measurable by this method, is small.

EXTRACTION FROM HUMAN URINE

The method of extraction of digitoxin from human urine is somewhat shorter than that used for extraction from rat urine. The urine is evaporated to dryness, the digitoxin extracted with chloroform, and the solution then evaporated and dried in vacuo. The chloroform residue is extracted with alcohol and the solution again dried. Chloroform is again used for extraction and is then evaporated in vacuo. The final residue is added to 50 ml. of Tyrode's solution to make a final solution of 50 ml. Again, as with the rat urine extracts, this dilution is made in order to eliminate the toxic factors of urine which have not been eliminated in the extraction until dilution is made.

TABLE 2.—*The Quantitative Detection of Digitoxin in (a) Tyrode's Solution, (b) Rat Urine, and (c) Human Urine*

TYRODE'S		RAT URINE		HUMAN URINE	
Concentration of Digitoxin (Micrograms per ml.)	Av. Time "Digitalis Effect" (Minutes)	Micrograms added to 10 cc. volume	Av. Time "Digitalis Effect" (Minutes) Sample Diluted 1/60	Micrograms added to 200 cc. volume	Av. Time "Digitalis Effect" (Minutes) Sample Diluted 1/50
.001	over 60	1	ND*	1	ND*
.005	45	2	32	2	48
.01	41	4	19½	3	35
.05	23	6	16	4	26
.1	12	8	12	6	22
.5	6	10	8	8	17
1.0	4			12	11
				16	8

---

* ND—same as in Table 1.

Table 3.—*Excretion of Digitoxin in the Rat After Intraperitoneal Injection of Digitoxin (0.1 Microgram per Gm.)*

		1st 24 HOURS			2nd 24 HOURS 2 MICROGRAMS ADDED TO SAMPLE		
Rat	Weight (Gm.)	Urine Volume (Ml.)	Av. Time "Digitalis Effect" (Minutes) Sample Diluted 1/60	Amt. Digitoxin Excreted (Micrograms)	Urine Volume (Ml.)	Av. Time "Digitalis Effect" (Minutes) Sample Diluted 1/60	Amt. Digitoxin Excreted (Micrograms)
1	145	20	over 60	ND*	36	39	ND*
2	170	10	over 60	ND	10	36	ND
3	160	8	over 60	ND	9	40	ND
4	155	15	over 60	ND	5	31	ND
5	170	10	over 60	ND	20	28	ND
6	175	14.5	over 60	ND			
7	165	7	over 60	ND			
8	176	9	over 60	ND			
9	169	22	over 60	ND			

* ND indicates no digitoxin could be detected (i.e., less than 1 microgram.)

Table 4.—*Excretion of Digitoxin in the Rat After Intraperitoneal Injection of Digitoxin (1.0) Micrograms per Gm.)*

		1st 24 HOURS	
Rat	Weight (Gm.)	Urine Volume (Ml.)	Amount Digitoxin Excreted (Microgram)
1	215	16.0	6.40
2	210	25.0	10.00
3	241	16.0	9.60
4	180	8.0	3.30
5	230	11.0	7.00
6	250	28.0	8.00
7	230	8.0	7.00
8	220	46.0	9.00
9	210	17.0	6.00
10	250	38.0	8.00

PROCEDURE

Embryonic duck hearts were exposed to this latter solution as with the rat urine extracts, and the time of "digitalis effect" observed.

Approximately 50 per cent loss of digitoxin occurred in the extraction of human urine samples if quantities below 12 micrograms were used. This loss, however, at any given concentration of digitoxin in an original volume of 200 ml. of human urine, was relatively constant. Therefore, standards were made consisting of extracts of known amounts of digitoxin added to 200 ml. quantities of human urine. Table 2 shows the different times of "digitalis effect" at any given concentration. Again it is important, in comparing this with the standard results in Tyrode's solution, to take into account the dilution factor of 1/50 (Table 6).

The urinary excretion of digitoxin of seven patients was tested by this method and recorded in Table 5. Each of these patients, five females and two males, with an average age of 65 years, and an average weight of 151 pounds, was given a total of 1.2 mg. (1,200 micrograms) of digitoxin in divided doses over a six-hour period, and urine collected from the time of the initial dose. It will be noted that four of these patients had hypertension, two had coronary artery disease, and one was psychoneurotic and had no organic disease. Only two patients showed evidence of cardiac failure.

In the first 24 hours the urinary excretion of digitoxin as measured by this method in these patients was found to range from less than 5 micrograms to 62 micrograms,* giving an average percentage excretion of 2.2 per cent with a range from less than 0.4 per cent to 5.2 per cent.

In the second 24 hours the urinary excretion of digitoxin was found to range from less than 3 micrograms to 25 micrograms, or a percentage range of from less than 0.2 per cent to 2.1 per cent.

The urine of only two patients so far has been tested in the third 24-hour period and the digitoxin excreted was 8.7 and 12.0 micrograms respectively, or a percentage of 0.7 per cent and 1.0 per cent respectively.

DISCUSSION

It will be noted that as the data obtained were on elderly subjects, diminution of renal function may have been a factor; but since the rate of glomerular filtration in such subjects probably would not be reduced more than 30 per cent, the amount of digitoxin excreted theoretically by a healthy, youthful kidney would still be relatively small.

In view of the fact that it is generally considered that complete absorption of digitoxin occurs after oral administration, failure to find a major portion of it in the urine suggests that the role of the human kidney in the excretion of digitoxin may be secondary to that of some other organ or organs.

On the basis of studies now being carried out, it can be said that such results do not necessarily apply to patients on maintenance doses of digitoxin.

There are, of course, several possible explanations for this moderate renal excretion of digitoxin. Hatcher and Eggleston in their work in 1919[4] concluded, from their much less accurate quantitative measurement, that digitoxin is largely destroyed in the body, that part of it is fixed in the liver, and that only traces of it appear in the urine and feces.

Another strong possibility is that digitoxin may be adsorbed so strongly to serum protein that ex-

---

*Micrograms of digitoxin determined in 200 ml. sample, compared to standards and the total 24-hour output of digitoxin figured on the basis of the total 24-hour urinary output.

Table 5.—*Excretion of Digitoxin in Human Subjects (Oral Ingestion of 1.2 Mg. Over 4-Hour Period)*

						FIRST 24 HOURS			SECOND 24 HOURS			THIRD 24 HOURS		
							Digitoxin Excreted			Digitoxin Excreted			Digitoxin Excreted	
Case	Weight (lbs.)	Age	Sex	Diag.*	Congestive Failure	Urine (Ml.)	Micrograms	%	Urine (Ml.)	Micrograms	%	Urine (Ml.)	Micrograms	%
1	150	54	F	Hyp.	No	770	22.0	1.8						
2	130	69	M	Hyp.	No	1000	30.0	2.5						
3	175	69	M	Cor.	Yes	1120	<5	—	1450	14.5	1.2	870	8.7	0.7
4	130	68	F	Cor.	No	580	5.8	0.5	850	25.0	2.1			
5	120	67	F	Hyp.	Yes	510	10.0	0.8	650	<3.0	—			
6	140	66	F	N.D.	No	2050	62.0	5.2	810	12.0	1.0			
7	210	64	F	Hyp.	No	2496	25.0	2.1	2150	<10.0	—	1160	12.0	1.0

* Hyp.—Hypertension. Cor.—Coronary Artery Disease. N.D.—No disease.

cretion is minimal. This adsorption of digitoxin has been in striking contrast to the lack of adsorption of the digitalis glycoside Lanatoside C, as demonstrated in a previous paper.[2] There is probably also similar fixation to other proteins in the tissues of the body.

2211 Post Street.

Table 6.—*Comparison Between Tyrode's Solution and Urines in Regard to Time of "Digitalis Effect"*

	Time of "Digitalis Effect" for Urine Sample Diluted 1/60 (Minutes)	Actual Quantity Digitoxin Added to Original Urine (Micrograms)	Actual Quantity of Digitoxin per Ml. in Final Solution if all Extracted (Micrograms)	Time of "Digitalis Effect" in Tyrode's Solution Expected with Digitoxin Concentration per Ml. as in Col. III (Minutes)
Rat Urine	ND*	1.00	.016	37
	32	2.00	.033	28
	19½	4.00	.066	17½
	16	6.00	.100	12
	12	8.00	.130	11
	8	10.00	.160	10½
Human Urine	ND	1.00	.02	35
	48	2.00	.04	26
	35	3.00	.06	19
	26	4.00	.08	15
	22	6.00	.12	11½
	17	8.00	.16	10½
	11	12.00	.24	9
	8	16.00	.32	8

* ND indicates that no glycoside could be detected by occurrence of "digitalis effect" in embryonic heart preparation.

REFERENCES

1. Bine, R., Jr., and Friedman, M.: Quantitative detection of minute concentrations of digitoxin, Proc. Soc. Exp. Biol. & Med., 69:487, 1948.
2. Bine, R., Jr., and Friedman, M.: Observations concerning the effects of blood upon the action of a digitalis glycoside, Am. J. Med. Sci., 216:534, 1948.
3. Friedman, M., and Bine, R., Jr.: Employment of the embryonic duck heart for the detection of minute amounts of a digitalis glycoside (Lanatoside C), Proc. Soc. Exp. Biol. & Med., 64:162, 1947.
4. Hatcher, R. A., and Eggleston, C.: Studies in the elimination of certain of the digitalis bodies from the animal organism, J. Pharm. & Exper. Therap., 12:405, 1919.

The Syndrome of Proximal Jejunal Loop Obstruction Following Anterior Gastric Resection

William F. Quinn, M.D., and John H. Gifford, M.D., *Los Angeles*

SUMMARY

An occasional complication following subtotal gastric resection of the antiperistaltic, antecolic type is closed loop obstruction high in the intestine. Unless recognized and treated early, it causes death rather quickly. Prompt surgical intervention is life-saving.

Symptoms which characterize the complication and distinguish it from other forms of high intestinal obstruction or stomal edema are (1) unrelenting epigastric or left upper quadrant pain and tenderness attended by clinical indication of shock, and (2) rather limited vomiting with absence of bile and small bowel contents in the vomitus.

Five cases occurred in a series of some 500 anterior long loop anastomoses. In three cases the complication was not immediately recognized and the patients died. In the other two cases, recovery followed surgical intervention.

THE purpose of this presentation is to discuss briefly a mechanical complication of subtotal gastric resection which, if unrecognized and untreated, results promptly in fatal obstruction high in the intestine. The mechanism is entirely different from the usual difficulties encountered due to edema or slight kinking in the region of the stoma, difficulties which usually subside under conservative decompression therapy. It is a complication which occurs only if the operation combines two procedures, namely (1) antecolic anastomosis between stomach and jejunum, and (b) anastomosis in which the proximal limb of the jejunal loop is placed at the lesser curvature of the gastric stoma.

There are, of course, two methods of attaching jejunum to stomach in regard to gastrointestinal flow. The jejunum may be attached to the stomach so that the proximal limb is at the lesser curvature (Figure 1) or at the greature curvature (Figure 2). Opinion is divided on the efficiency of these two methods, and is not conclusive one way or the other. Most surgeons agree that the jejunal loop should be brought up and attached to the stomach

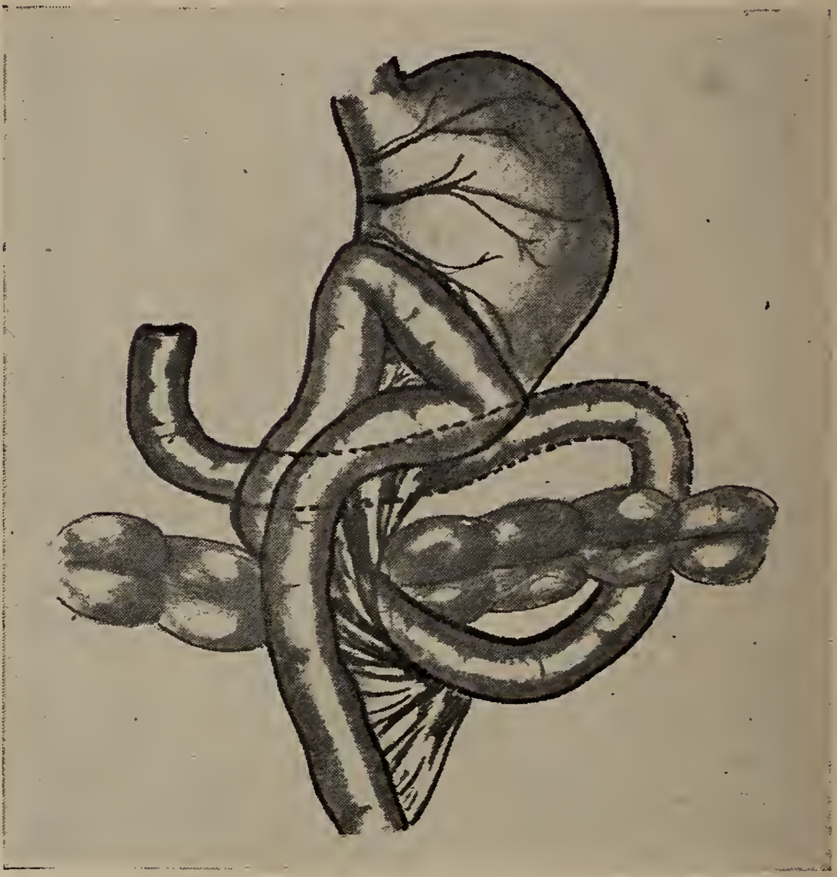


Figure 1. — Antecolic, antiperistaltic anastomosis between jejunum and stomach. The proximal jejunal limb is at the lesser curvature of the stomach.

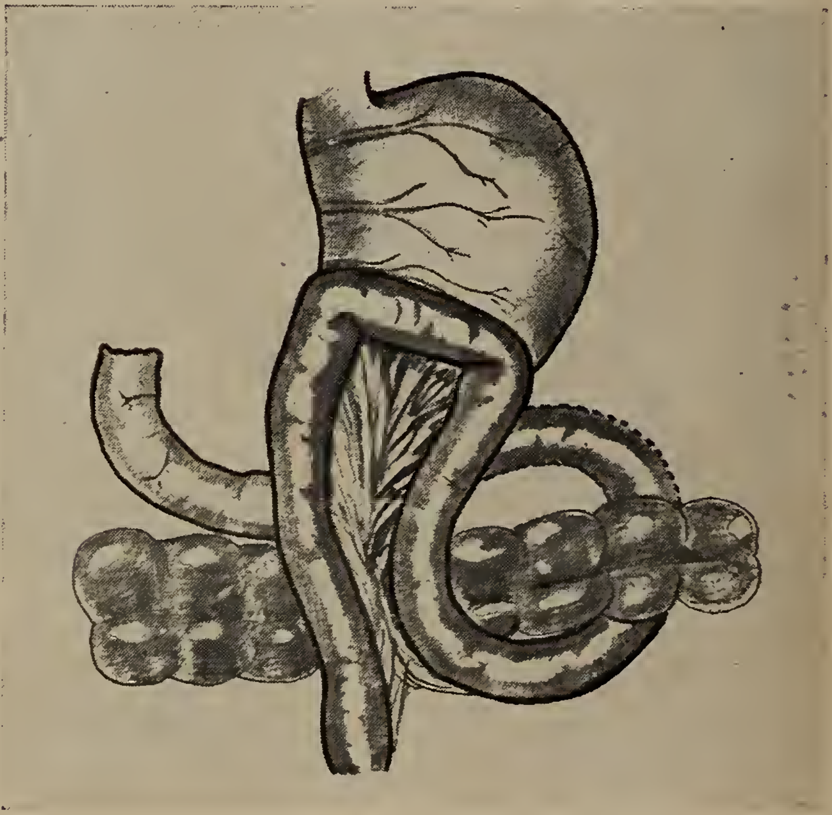


Figure 2.—Antecolic, isoperistaltic anastomosis between stomach and jejunum. The proximal jejunal limb is at the greater curvature of the stomach.

Presented before a meeting of the Section on General Surgery at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

From the Department of Surgery, College of Medical Evangelists, and the California Lutheran Hospital.

so that it lies in the easiest and most natural manner, regardless of whether it is placed in an isoperistaltic or antiperistaltic direction.

This point, however, appears to deserve much more careful consideration. It should be remembered that the root of the small bowel mesentery most commonly follows an oblique line beginning at the ligament of Treitz, just to the left of the second lumbar vertebra, ending opposite the right sacro-iliac joint in the right lower quadrant of the abdomen. When the jejunum is attached to the stomach so that the distal loop is at the greater curvature, the mesentery of the distal loop necessarily becomes twisted approximately 135° from this oblique line. While this may be somewhat difficult to visualize or describe, anyone can prove this point to his own satisfaction very readily in the morgue. Although mesenteric torsion apparently does not interfere with the blood supply of its own loop, it does shorten the mesentery so that pressure is occasionally exerted upon the proximal loop as the proximal loop passes between the shortened mesentery and the transverse colon (Figure 3). The pressure of the mesentery of the distal loop on the proximal loop may cause a complete intestinal obstruction of the closed loop type, a condition which, if unrecognized, is invariably rather promptly fatal. The picture is a dramatic one and, while infrequent (five cases in approximately 500 resections), it has certain characteristic features which should make its recognition possible to the experienced surgeon. It is particularly important to differentiate this kind of closed proximal loop obstruction, which requires prompt surgical intervention to insure against a fatality, from edema of the stoma, which will usually respond to conservative therapy.

CASE REPORTS

The following five cases are briefly presented to illustrate this particular mechanical complication.

Case 1: The patient was a 51-year-old female with clinical and x-ray evidence typical of carcinoma of the pyloric portion of the stomach. At operation carcinoma involving the lower third of the stomach was found and a subtotal gastrectomy of the anterior polya type was done. A long jejunal loop was utilized, the proximal portion of which was anastomosed to the lesser curvature of the stomach. An Abbott-Rawson tube was threaded into the distal jejunal loop for feeding purposes. The operation was without incident.

The first four postoperative days were uneventful. The feeding tube was removed on the third day and oral feedings well tolerated. On the fifth day pain and tenderness developed in the left upper quadrant. The pain was constant and was not colicky in nature. There was no abdominal distention, and no masses could be palpated. The pulse rate rose to 120 and the blood pressure fell to low levels. The patient vomited twice and it was noted that there was no evidence of bile or of small intestinal contents in the vomitus. Transfusions and vigorous supportive therapy were given but the patient died 18 hours later. Postmortem examination revealed a complete proximal jejunal obstruction at a point where the proximal jejunal loop passed between the distal anastomotic loop and the transverse colon. The obstruction was caused by pressure exerted by the mesentery of the distal jejunal loop (Figure 3). The entire small bowel proximal to the obstruction was distended with bile-colored fluid and was gangrenous. There was an area of perforation in this segment on the anterior surface of the first portion of the jejunum. The duodenal stump was intact in spite of the severe distention, and the gastrojejunostomy stoma was normal.

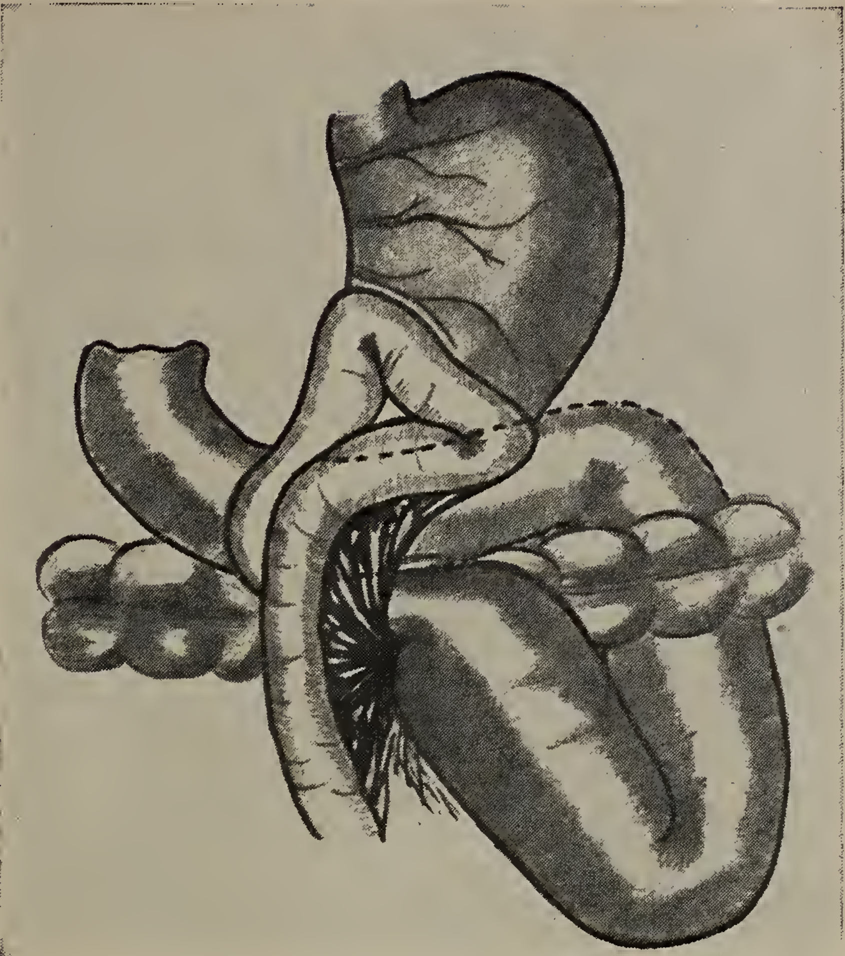


Figure 3.—Proximal jejunal loop obstruction. The duodenum and proximal jejunum are obstructed by the mesentery of the distal jejunal limb.

Case 2: The patient was a 53-year-old male with a history of peptic ulcer of 17 years' duration, with almost complete pyloric obstruction, and a 40-pound loss in weight.

Subtotal gastric resection was done and a penetrating ulcer 4 cm. in diameter was found on the posterior wall of the stomach near the lesser curvature. The lower half of the stomach was resected, leaving the ulcer bed on the pancreas; an anterior Hoffmeister repair was done, utilizing a long jejunal loop, the proximal portion of which was anastomosed to the lesser curvature of the gastric stoma. An Abbott-Rawson suction feeding tube was threaded into the distal jejunal loop. It was at first possible to recover bile from the gastric contents.

On the second day there was severe upper abdominal pain which was difficult to control with opiates. The pulse rate was elevated to 160 per minute, and the blood pressure fell to 60 mm. of mercury systolic and 40 mm. diastolic. The abdomen became distended and tender and it was noted that no bile was being returned through the gastric suction tube. Urinary suppression developed in spite of adequate parenteral fluids and during the subsequent 24 hours massive doses of plasma and blood (4,500 cc.) were given. The next day the condition of the patient seemed somewhat improved. The pulse fell to near normal limits and the blood pressure rose to 170 mm. systolic and 100 diastolic. The abdomen remained distended, tender and painful, however, with no evidence of peristalsis by auscultation. The patient died on the sixth postoperative day and at autopsy it was found that the proximal jejunum was completely obstructed by pressure exerted by the mesentery of the distal jejunal loop. The entire segment of jeunum and duodenum proximal to the point of obstruction was distended and almost completely gangrenous (Figure 3). The gastroenterostomy stoma was patent and the duodenal stump was intact in spite of the pronounced distention.

Case 3: An 81-year-old white male entered the hospital with clinical and x-ray evidence of pyloric carcinoma with almost complete obstruction. Subtotal gastrectomy was done for a large ulcer which was presumably carcinomatous, although the final report of the pathologist was "benign gastric ulcer." In a procedure of the anterior polya type, the distal jejunal loop was placed at the greater curvature of the stomach. The postoperative course was surprisingly smooth in view of the age of the patient, who left the hospital in good condition on the 16th postoperative day.

The patient remained in good health with no symptoms for nearly two years. Then one night he was awakened at 2 o'clock by severe abdominal pain which he attributed to an unusually large meal. The pain was continuous and the patient vomited previously eaten food. His wife stated that the vomitus did not appear bile-colored. Sent to the hospital, he was found to be in shock. The blood pressure was 68 mm. of mercury systolic and 58 mm. diastolic, the pulse rate 120, and the skin ashen. There was no vomiting at this time. Upon examination of the blood evidence of hemoconcentration was noted. The abdomen was slightly distended, non-rigid, but equisitely tender, particularly in the left upper quadrant, with sounds of hypoactive peristalsis. An x-ray film of the abdomen showed no evidence of mechanical bowel obstruction or of free air within the peritoneal cavity. The diagnosis at the time of admission was coronary occlusion with possible mesenteric occlusion seconary to detached mural thrombi. Supportive therapy was given but the patient died 11 hours after admission. At autopsy arteriosclerosis was noted, and particularly arteriosclerosis of the vessels in the mesentery. There was obstruction of the proximal jejunal loop by the mesentery of the distal jejunal loop, with gangrene of the involved segment. The duodenal stump was intact and the gastroenterostomy stoma was normal.

Case 4: The patient, a 49-year-old male, had a history of ulcer of the stomach of 25 years' duration with almost complete pyloric obstruction and a 15-pound loss in weight. Subtotal gastrectomy was performed for a duodenal ulcer which had penetrated into the head of the pancreas. The stomach showed the usual thickening and hypertrophy of long-continued obstruction. An anterior polya type anastomosis was done, and a long jejunal loop was used, the proximal limb being placed at the lesser curvature of the stomach. An Abbott-Rawson suction feeding tube was threaded into the distal jejunal loop. Some difficulty was encountered in freeing the duodenum from the pancreas in the region of the posterior perforation, but in general the procedure was without incident.

The first five postoperative days were uneventful. The feeding tube was removed on the third day and oral feedings including a soft diet were well tolerated. Late on the fifth day the patient noted abdominal discomfort. He became nauseated, and mild upper abdominal pain with distention developed. A Levine tube was inserted and approximately 1,000 cc. of gastric contents recovered. There was nothing resembling bile in this material. The upper abdominal pain became more severe and the patient also complained of severe but poorly localized pain in the lower left lumbar region. A large, firm, tender mass could be palpated in the left flank. The abdomen was silent. X-ray films of the abdomen showed nothing to suggest intestinal obstruction. The patient appeared to be in mild shock; there were beads of perspiration standing out on his forehead. In view of these findings and the absence of bile in the vomitus, a diagnosis of proximal loop jejunal obstruction was made and an exploratory laparotomy was done.

The abdomen was opened and it was found that the proximal jejunum was obstructed by pressure exerted by the mesentery of the distal jejunum. The bowel proximal to the point of obstruction was dilated to four times average size and the picture presented was similar to that of small bowel volvulus. It was dusky blue in color but appeared viable, in that the color changed to nearly normal when the loop was withdrawn somewhat from the point of obstruction. In order to prevent recurrence, enteroanastomosis was done between the distal and proximal loops of jejunum.

Recovery was uneventful and the patient was discharged from the hospital on the 11th postoperative day. Two years later the patient was in good health with no dietary restrictions, had gained weight, and had had no recurrence of symptoms of ulcer.

Case 5: The patient was a 39-year-old male with clinical and x-ray evidence typical of duodenal ulcer with pyloric stenosis. A subtotal gastrectomy was done and an anterior long loop polya type anatomosis was made, with the proximal jejunal loop placed at the lesser curvature. During the first six days it appeared that the gastrojejunostomy stoma was not functioning well although bile was constantly present. On the seventh day fluids began passing through the stoma and the patient's condition was quite satisfactory until the 11th day. The patient then vomited gastric contents in which there was no evidence of bile and complained of epigastric and left abdominal pain which was fairly constant in nature. The symptoms subsided when a Levine tube was inserted, and the tube was removed after two days. The patient remained in good condition until the 17th postoperative day, when severe upper abdominal pain developed. It continued although morphine was given. The patient vomited twice and it was noted that there was no evidence of bile in the vomitus. A semi-fluctuant, tender, movable mass could be palpated in the left upper quadrant and the patient appeared to be in mild shock. An x-ray film of the abdomen revealed no abnormalities, but a diagnosis of acute intestinal obstruction was made and exploratory laparotomy done.

It was found that the proximal loop of jejunum was obstructed by pressure exerted by the mesentery of the distal loop. The jejunum and duodenum were dilated to about five times normal size, but there was no evidence of leakage at the duodenal stump. An entero-enterostomy was made between the proximal and distal loops. Recovery was uneventful. Six years later the patient's weight was normal, there were no dietary restrictions, and there had been no recurrence of symptoms of ulcer.

DISCUSSION

The five cases presented have certain features in common. In each the complication of high, proximal closed-loop intestinal obstruction occurred following subtotal gastric resection with an anterior polya or Hoffmeister type of procedure in which the proximal jejunal loop was placed on the lesser curvature of the gastric stoma. In each case the mechanism of obstruction, as demonstrated by postmortem examination or by laparotomy, was identical, namely, obstruction of the proximal loop due to pressure of a shortened mesentery of the distal loop which was placed along the greater curvature portion of the stomach. The continued secretion of bile and pancreatic juice into the closed loop caused pronounced distention of the duodenum and proximal jejunum in each case. In the three cases in which the patients died the pressure caused necrosis and gangrene. The increased intraluminal pressure noted in Case 1 was severe enough to result in perforation through the bowel wall. Remarkably, the duodenal stump remained intact in all cases despite what must have been great intraluminal pressure.

The clinical picture was similar in all cases in that the onset was abrupt; in four of the cases onset occurred in the early postoperative course. Continuous, unrelenting epigastric or left upper quadrant pain and tenderness, attended by clinical shock, were observed in all cases. In two instances the distended bowel was felt as a mass in the left upper quadrant. The vomiting was not continuous, repeated, or profuse, and the vomitus was characterized by the absence of bile and small bowel contents. It is in these two respects, namely, the character of the pain and vomiting, with absence of bile in the vomitus, that the condition under discussion differs from other forms of high intestinal obstruction or stomal edema.

In the three cases in which an x-ray film of the abdomen was made, there was no evidence of gas-filled, distended small bowel. This is to be expected, as there is, of course, no opportunity for swallowed air to enter the involved segments, and gas-forming bacilli are practically absent in this portion of the small bowel.

This particular mechanical complication could, of course, be avoided by making the gastrointestinal anastomosis posterior rather than anterior to the transverse colon. There are, however, numerous complications associated with retrocolic anastomosis which have been well described in the literature.

Another cause of difficulty later is a tendency, in doing a retrocolic anastomosis, to skimp somewhat on the amount of stomach resected because of the technical difficulties involved.

Possibly further experiences with bilateral vagotomy with conservative posterior resection will prove helpful on this point. It should be noted, incidentally, that in the five cases reported herein, none of the patients were suitable candidates for vagotomy according to present-day indications for this operation.

The complication described in this presentation cannot be prevented by selecting a jejunal loop more distal to the ligament of Treitz in the hope of obtaining a longer loop with which to make the anastomosis, since the length of the mesentery is never greater than it is at a point approximately one foot distal to the duodenal jejunal juncture.

It can be prevented, however, by routinely attaching the proximal jejunal loop to the greater curvature, with the distal loop along the lesser curvature, as this procedure occasions no torsion on the mesentery. This method would appear to be somewhat more mechanically and physiologically correct because it can be accomplished by selecting a loop of jejunum nearer the duodenojejunal juncture for the anastomosis, thereby lessening the hazard of postoperative jejunal ulceration.

It has been pointed out that the more distal the jejunal loop selected for the anastomosis, the more liable jejunal ulceration is to occur, since the jejunum is not prepared by nature to receive acid contents. It is the opinion of the authors, however, that the development of a marginal ulcer is evidence of too conservative a resection rather than of the employment of too long a jejunal loop. In a series of 500 anterior long loop anastomoses, there was only one known recurrent ulceration. It occurred in a patient who was, incidentally, a chronic alcoholic.

Since peristalsis in the stomach is directed toward the pyloris, placing the distal loop at the lesser curvature appears somewhat more nearly isoperistaltic than the reverse.

While removal of most of the lesser curvature at the time of the resection will thus place the distal loop of jejunum at a very high level, this has proven to be an advantage, in that the stomach will empty more slowly and this has considerably reduced the incidence of the distressing symptoms now generally described as the "dumping syndrome."

Successful treatment of proximal jejunal loop obstruction lies in prompt recognition and surgical intervention. The complication can be corrected surgically by performance of an enteroanastomosis between the distended and collapsed jejunal loops. It is not felt, however, that this would justify the routine employment of an enteroanastomosis in view of the fact that diversion of the alkaline bile from the area of the stoma appears to increase the incidence of marginal ulceration. In this regard it should be noted that proximal jejunal loop obstruction occurred in only about 1 per cent of cases in a series of 500 anterior long loop anastomoses. Attention should be called to the fact that in the three cases in which the nature of the complication was not recognized, the patients died, while the two patients who underwent surgical intervention not only were relieved of the obstruction but obtained relief from the condition for which the primary operation was done.

1930 Wilshire Boulevard.

Recent Trends in Public Health

Malcolm H. Merrill, M.D., *Berkeley*

SUMMARY

Environmental sanitation is experiencing a reawakening with concerted drives at control of water and atmospheric pollution, mosquito and rodent control, and improvement in restaurant sanitation. Communicable disease control efforts are being intensified.

With prolongation of life, chronic diseases are assuming increasing importance as public health problems. Maintenance of standards of hospitals and provision for more adequate hospital facilities are also receiving attention. Mental health and chronic alcoholism are being considered as a public health problem.

With all these new trends emphasizing prevention of disease, increasing teamwork between physicians in private practice and in public health practice is being manifested. Preventive medicine and public health are now a recognized specialty in medicine.

ONE hundred years have passed since the organized public health movement in the United States received its first real impetus. The beginnings of the modern public health department in this country date from the appointment in 1848 of a "sanitary commission" by the Governor of Massachusetts "to prepare and report to the next General Court a plan for a sanitary survey of the state, embracing a statement of such fact and suggestions as they think proper." Lemuel Shattuck, the great public health pioneer, was chairman of the three-man commission. The "Report of the Sanitary Commission" submitted on April 25, 1850, formulated for the first time the basic pattern for the development of public health.[10] This report "Contained an outline of a state system of public health administration so comprehensive that even today it may serve as an ideal for future realization."[11] The succeeding half century saw the revolution wrought by the founding of the science of bacteriology and the early experimental work which laid the foundation for the science of public health engineering with its modern methods of water and sewage treatment.[8] Then followed methods for pasteurization of milk, control of insects and rodents and the development of other phases of environmental sanitation. The vast changes in human health and welfare emerging from this phase of public health endeavor were accomplished for the most part through the application of engineering principles. The result has been phenomenal. From the year 1856 to 1945 typhoid fever decreased 99 per cent, diarrhea and enteritis 97 per cent, and yellow fever and cholera have ceased to exist in the United States.[2] These achievements were largely due to advances in environmental sanitation. Do these remarkable achievements mean that the main problems relating to environmental sanitation have been solved? Lest the job be considered complete, it is recommended that consideration be given the recent summary by Wolman[12] entitled "Sanitation of Yesterday—But What of Tomorrow."

Referring to water and waste disposal, Wolman states, "In the State of Massachusetts as in the rest of the United States, it is doubtful whether there is a single stream today which has not deteriorated in a major sense in its quality since 1849. There is hardly a city in Massachusetts or one in the rest of the United States, in which the conditions of housing are not essentially worse than those at which the Shattuck report directed severe criticism. There is not a city in Massachusetts or one in the rest of the United States . . . in which the conditions of the atmosphere are not immeasurably worse today than they were when Mr. Shattuck leveled his attack on this phase of the environment."

Consider the pollution of rivers, harbors, and beaches of California, the substandard housing in both metropolitan and agricultural areas, and the atmospheric pollution of large and populous areas of the state to see the application of Wolman's statement. Add to this the potential hazards of mass application of insecticides, fungicides and pesticides to the fields, orchards and storehouses throughout the state, and another environmental sanitation problem appears.

In California, particularly, the environmental sanitation problems are further complicated by the vast migration of farm laborers and of vacationists and tourists which characterizes life in California, and also by the rapid industrialization of the state with the consequent industrial environmental sanitation problems.

During the century since the founding of modern sanitation, we have gone far in the elimination of epidemic diseases which are borne in water and milk or by insects. Yet during this time other environmental conditions have gradually developed which are important actual or potential hazards to health.

It is only in recent years that we have come to realize the magnitude of these latter sanitation problems and have begun doing something about them. This is one of the recent trends in public health in California. The State Board of Public Health three years ago determined that the dumping of raw sewage into the waters of the state must cease. A

Chairman's address, read before the Section on Public Health, at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

resolution of the board called for review of all outstanding permits for sewage disposal and directed that no new permits would be issued to communities unless the sewage were properly treated.[7] Santa Monica Beach was quarantined and court action instituted against the City of Los Angeles. The result has been the development of an extensive sewage disposal project. Cities in increasing number are taking steps to solve their sewage disposal problems. Most of some $75 million appropriated by the State Legislature for construction of local facilities has been used for modernization of sewage disposal systems. This trend has been reinforced by Congressional enactment of a Federal Stream Pollution Control law. This will serve to stimulate a nationwide attack on stream pollution. The California State Legislature has also taken cognizance of the atmospheric pollution problem and provided a legal pattern for the establishment of air pollution control districts. Such a district is now in operation in Los Angeles County. Concurrently the State Department of Public Health is tightening up on municipal garbage and refuse disposal. The state and local health departments are re-emphasizing enforcement of restaurant sanitation in which they are aided by the recently enacted Restaurant Sanitation Act.[1] Other fields of environmental sanitation such as intensification of mosquito and rodent control are also under way. While these activities may be said to have as a primary purpose the prevention of communicable diseases, the implications are much broader. A clean, wholesome atmosphere; clean, wholesome lakes, beaches, streams, and recreation areas; light, well-ventilated, clean houses; and rodent- and insect-free communities all contribute to health in a positive way beyond the prevention of communicable disease.

Truly, this intensified attack on problems in the field of environmental sanitation is one of the most significant recent trends in public health.

COMMUNICABLE DISEASE CONTROL

The developments through the past century have involved primarily health departments in their association with sanitary and construction engineers coupled with extensive public construction projects. Physicians were not directly involved. They were indirectly involved, however, in that their medical practice changed with the decline in the incidence of the various water-, food- and insect-borne communicable disease.

In contrast to this, however, is the role played by the practicing physician in the phase of public health progress next to be discussed. Almost at once after the identification of bacteria as causative agents of disease it became evident that all communicable diseases were not amenable to control through environmental sanitation measures. In some instances, such as smallpox and diphtheria, specific immunization techniques were early developed. Others have followed. Immediately the practicing physician and the health department became partners in the planning and execution of mass immunization projects. For many years such projects were spotty and sporadic. As health departments developed into efficiently operating organizations, such programs took on form and substance. The physician gained confidence in the health department, and cooperation in such projects became an accepted practice. It is now recognized that the prevention of smallpox, diphtheria and pertussis is dependent upon the immunization of the individual. Much of this is done ordinarily by the physician as part of his regular practice. Yet there must be careful organization, planning and education of the public by the health department if the larger percentage of the community is to be immunized. As state and local health departments are becoming staffed with professionally trained and qualified personnel this partnership between health departments and physicians in immunization programs is assuming a new significance.

Certain communicable diseases are not primarily amenable to either improved sanitation or immunization. Tuberculosis is such a disease. Efforts to control this disease bring even one step closer the working relationship between the health department and the practicing physician. Perhaps one of the most significant and far-reaching single recent trends in public health is the plan to secure chest x-ray films of some four million California adults. This is to be an all-out attempt to locate and bring under control the bulk of the remaining infectious cases of tuberculosis in the state. This has been planned and is to be executed not only by the health department and the practicing physician, but by the entire community. In these mass surveys, physicians and health officers will not only accelerate the control of tuberculosis but in addition will have an opportunity to experiment jointly in community-wide organization and operation of a health project. This trend toward community-wide participation in public health projects under the leadership of physicians and the health department may have far-reaching significance. It may well provide experience from which varied future community-wide health projects may develop.

CHRONIC DISEASE CONTROL

All the previously mentioned developments of the past century have resulted in a changing age distribution of our population. This has necessitated a shift in public health emphasis. Diminishing neonatal and infant death rates, practical elimination of a number of major communicable diseases, pronounced reduction of maternal death rates, and, more recently, the amazing saving of life being wrought by specific chemotherapy and antibiotic therapy, have all contributed to the prolongation of life. The average age of the populace is increasing. As acute infectious diseases decrease, chronic diseases such as cancer, diabetes, heart disease and arthritis assume an ever-increasing importance in the total public health picture. In the recent study by the chronic disease service of the California State Department of Public Health, it was shown that from 1910 to 1940 the death rate from a selected group of chronic diseases increased from 555 to 762 per 100,000. At the same time the death rates from a selected group of communicable diseases decreased from 413 to 126.[5]

This changing age distribution of the population with the increasing importance of chronic diseases as the major cause of morbidity and mortality (and consequently as public health problems) is another significant recent trend in public health. As this field of activity develops, health departments and practicing physicians will be brought into even closer working relationships than ever before. Careful study and experimentation will be required to delineate the areas of responsibility of each. A beginning has been made in California through the chronic disease study authorized by the Legislature two years ago and recently completed by the State Department of Public Health. The report[5] was the result of the joint efforts of the State Department of Public Health, the California Medical Association, and other professional and lay organizations. In it the main elements of the chronic disease problem together with approaches to a solution were presented. Still another recent development is the pilot study of a technique for finding and placing under medical care persons with some of the chronic diseases. This was carried out recently in San Jose under the auspices of the Santa Clara County Medical Society. (A report of this multiphasic survey was published in the December 1949 issue of California Medicine.) Here is a further example of a type of health department-medical association cooperative endeavor that promises much for the future.

HEALTH DEPARTMENTS AND HOSPITALS

Still another recent trend worthy of mention pertains to responsibilities recently given to health departments in the hospital field. In an effort to insure reasonably safe and effective hospital facilities, a system of inspection and licensing of hospitals by the State Department of Public Health has been established. Furthermore, for the first time considered attention is being given to quantitative needs and geographic location of hospitals. Under recent federal and state legislation, a statewide survey has been made of present hospital and health center facilities.[6] Additional needs in the various categories of hospital beds and of health centers have been defined. Public funds, both federal and state, have been made available to assist in the construction of needed facilities. Up to this time funds have been allotted to assist in the construction of some 23 hospitals in rural areas of the state. In the planning of these programs, physicians, hospital administrators, representatives of the public being served, and the health departments are brought together. Here is another example of how cooperative planning and action are beginning to meet an urgent public health need.

MENTAL HEALTH

The prevention of mental illness is a vast new territory awaiting the plow. Modern public health is beginning to appreciate its responsibility in this large field of human illness. The attack in this field simulates in many ways the administrative procedures required in the field of the other chronic diseases. Here is an individual problem with each patient requiring an individual approach. Some progress has already been made in the development of techniques for attacking this problem. The objective is to prevent mental illness. It is now recognized that through proper training of parents and others dealing with children in their formative years, much can be done to prevent the development of abnormal personality traits. Failing prevention, the next objective is to find mental illness in the incipient stages when corrective measures may be most effectively applied. Only a bare beginning has been made in the development of the public health program in this field. Congress has enacted legislation authorizing the establishment of a National Institute of Mental Health for research and demonstration. Federal appropriations have also been made that provide grants-in-aid to states to develop this public health program.[3] Here is presented a unique opportunity for physicians and health departments to jointly develop an urgently needed area of public health.

CHRONIC ALCOHOLISM

Yet another trend is in the direction of recognizing chronic alcoholism as a disease and approaching the condition as primarily a medical problem. The California Medical Association during the past year has shown its concern and has appointed a committee to study this problem and prepare a report for the Association.* Already the concept of a medical approach to this problem is gaining support throughout the state. Several local governments of the state are currently giving serious consideration to substantial appropriations for the provision of medical facilities to attack this problem.

DEVELOPMENT OF LOCAL HEALTH SERVICES

All the trends mentioned thus far pertain to specific health problems. One of the most significant recent trends, however, is in the field of public health administration. The California Local Public Health Assistance Act, which was passed by the 1947 California Legislature, provided a state subsidy for local health work designed to strengthen and extend local health departments in the state. The act also created a Conference of Local Health Officers. It provides that this conference must approve any regulations pertaining to the administration of the subsidy prior to adoption by the State Board of Public Health. This unique organization is already coming to play a dominant role in directing the currents of the new trends in public health in California. It represents a new departure in public health administration wherein the local health officer becomes a full-fledged partner in planning the statewide public health program.[4] This action represents a long step forward in cooperative planning for public health administration. It is noteworthy that the California Medical Association played a significant role in the formulation of this legislation.

---

* See Page 40, this issue.

HEALTH DEPARTMENT-MEDICAL ASSOCIATION COOPERATION

For several years the director of the State Department of Public Health has been meeting regularly with the Council of the California Medical Association at the invitation of the Council. Many of the new trends in public health already discussed have been considered in these joint meetings. A significant expansion of this general procedure is now under consideration involving the appointment of a joint study committee composed of representatives of the Council of the California Medical Association and the Conference of Local Health Officers. All problems pertaining to public health that come before the Council would be referred to this joint committee for study and referral back to the Council with recommendations.

Furthermore, in some counties local health officers have been participating in the meetings of executive committees or councils of local medical associations on a basis comparable to the relationship established by the director of the State Health Department and the Council of the C.M.A.

All of these new trends facilitate mutual trust and understanding between health departments and the medical associations, with resulting benefit to the people of California whom we as physicians all serve.

THE PROFESSIONALIZATION OF PUBLIC HEALTH

There is one additional trend in public health which is most significant. This is the trend toward professionalization of the numerous special disciplines in public health. Since the era when appointments to public health positions were dictated by political expediency, tremendous strides have been made toward requiring specialized training for eligibility to public health positions. Competitive examinations are more and more being utilized as the basis for selections. Shepard[9] recently reviewed this trend in public health and pointed out the part the American Public Health Association has played in the development of personnel standards in the various specialties in public health.

A recent development in this field which is particularly significant to all physicians is the creation by the American Medical Association of the American Board of Preventive Medicine and Public Health. By this act the A.M.A. has given formal recognition to preventive medicine and public health as a specialty in the medical field. This can only add to the stature and importance of the public health section of the California Medical Association. At the same time, it should further facilitate the development of even closer working relationships between official health departments and the state and county medical associations in California. It is the culmination of a trend long since inaugurated which is designed to utilize even more fully the talents of our profession in planning public health programs and in helping to solve the perplexing public health problems faced by the people of California.

3093 Life Science Building, University of California.

REFERENCES

1. California Restaurant Sanitation Act, Sections 28600-28665 inclusive, California Health and Safety Code.

2. Dublin, L. I.: A centennial of public health, Am. J. Pub. Health, 38:1635, Dec. 1948.

3. Lowry, James V.: How the National Mental Health Act works, Pub. Health Rep., 64:303, March 11, 1949.

4. Merrill, Malcolm H.: Federal-state-local relationships in financing local health services, Pub. Health Rep., 63:244, February 20, 1948.

5. Report of the Chronic Disease Investigation, California State Department of Public Health, California State Printing Office, Sacramento, January 1949.

6. Report of the California Hospital Survey, California State Department of Public Health, March 1948.

7. Resolution Against Disposal of Raw Sewage in the Waters of the State Without Appropriate Sewage Treatment. Adopted by the California State Board of Public Health, March 11, 1946.

8. Scheele, L. A.: Address of Welcome, Proceedings of the Forty-Seventh Annual Conference of the Surgeon General With the State and Territorial Health Officers, November 15, 1948.

9. Shepard, William P.: The professionalization of public health, Am. J. Pub. Health, 38:145, Jan. 1948.

10. Smillie, W. G.: Lemuel Shattuck: America's great public health pioneer, Am. Pub. Health, 39:135, Feb. 1949.

11. Whipple, G. C.: State Sanitation: A Review of the Work of the Massachusetts State Board of Health, Cambridge, Harvard University Press, 1917, vol. 1, p. 30.

12. Wolman, A.: Sanitation of yesterday—But what of tomorrow, Am. J. Pub. Health, 39:145, Feb. 1949.

* * *

The Shoe-Fitting Fluoroscope as a Radiation Hazard

LEON LEWIS, M.D., and PAUL E. CAPLAN, M.P.H., *Berkeley*

SUMMARY

Tests of direct beam intensity and stray radiation from shoe-fitting fluoroscopes indicate wide variability of exposure of patrons and salesmen, with some exposures far in excess of standards proposed for safe use of the apparatus.

The principal potential danger is interference with bone growth in children as a result of careless use or uncontrolled dosage of x-ray. Although less likely, there is also some possibility of excessive exposure of shoe salesmen in exceptional circumstances.

The growing probability of increasing use of ionizing radiations warrants vigorous governmental control or possibly elimination of procedures of questionable merit which involve public risk.

THE fluoroscopic shoe-fitting machine has been used in this country for approximately 25 years. During that time hundreds of thousands of adults and children have had their feet exposed at intervals to x-ray beams. Yet, because of the latent period between cause and effect in low dosage radiation, it is impossible at present to determine merely by clinical examination whether or not deleterious influences have been produced by this device. It is also difficult to estimate the probability of harmful effect.

Despite the relatively long experience in the use of the fluoroscopic shoe fitter, it is remarkable that scientific studies on x-ray dosage of the instruments have been published only during the past two or three years.[11, 6, 4, 10] Current interest in this subject is no doubt attributable to the fact that physicians and health physicists everywhere are beginning to be concerned about every potential source of radiation, because of the possibility that widespread even though mild contamination may result from peaceful utilization of nuclear fission, quite irrespective of the potentialities of the atomic bomb. Also, wartime experience with careless use of portable fluoroscopic devices in industrial medical departments has encouraged increased precaution not only among radiologists but among others who use x-rays as well.

Since there have been several recent reports of the extent of radiation exposure involved in the use of shoe-fitting fluoroscopes, the question may arise as to the need for an additional report on this subject. The following data are presented principally for three reasons: (1) Radiation intensities were determined for weekly exposures of employees. (2) The observations made and the techniques used for monitoring the shoe-fitting machines provide some basis for the discussion of instrumentation in general. (3) The additional data represent confirmation in another region of the country (the San Francisco Bay area) of findings already established elsewhere,[11, 6, 4] and provide a wide basis for review of the public health implications of the device in question.

A detailed description of the x-ray shoe-fitting machine is given in the report by Fredrick and Smith.[6] The instrument consists of an ordinary fluoroscope, the x-ray tube of which is placed near the floor. The opening for the customer's feet is situated between the tube and a fluoroscopic screen, and the light image is reflected to three openings at the top of the apparatus, where the customer and the salesman, as well as a third person, may view the fitting. Usually there is an aluminum filter placed between the feet and the x-ray tube, but this is frequently either worn or absent.[4] The degree of shielding varies with the apparatus and its maintenance. The most modern type of machine is shielded with lead lining in the box containing the tube, and the eyes of the viewers are protected by means of a leaded glass over the fluoroscopic screen. Fredrick and Smith[6] report observation of machines with oil-immersed x-ray tubes.

Most of the machines were rated at 7 milliamperes maximum current, although several were operated at higher levels as shown by milliammeters observed during operation. The tubes operated at 50 kilovolts in all instances where kilovoltage was determined. Two home-made machines were found in which no electrical instruments were installed. No attempt was made to determine the physical and electrical factors of the machines since this information has already been well established.[6] This study was directed principally toward an accurate determination of the intensity and relative dosage to which both employees and customers were exposed in the course of normal operations. Even this purpose was not entirely achieved, since it was impossible to maintain sufficient supervision of the shoe salesmen to determine accurately the degree of exposure without producing a nullifying antagonism on their part.

From the School of Public Health, University of California, Berkeley; and the Bureau of Adult Health, California State Department of Public Health.

The investigation here reported was conducted with the cooperation of the staff of the Division of Industrial Safety of the California State Department of Industrial Relations and the Bureau of Adult Health of the California State Department of Public Health.

INSTRUMENTATION

Portable apparatus currently available for the determination of x-ray exposures consists principally of the following: (1) ionization chambers of the pencil dosimeter (minometer or electroscope) type; (2) the ion chamber or ionization rate meters; (3) the dosimeter r-meter; (4) the film badge; (5) the Geiger-Müller counter. Although other investigators have used the dosimeter r-meter for detecting stray radiation, it was considered advisable to use the minometer ionization chambers (Victoreen) for this purpose during the brief periods of operation of the machines. The minometer chambers used have maximum capacities of 10, 100 and 200 mr. Three readings were made at each site in most instances. Excellent reproducibility of results was found and all ionization chamber instruments functioned well under conditions of normal humidity. On foggy and humid days it was impossible to charge the chambers. Victoreen dosimeter r-meter chambers with a capacity of 100 r maximum were used for detecting direct beam radiation.

For measurement of weekly exposure each salesman was provided with two film badges. One of these was to be worn in the trouser watch pocket and the other in a trouser cuff. Sales ladies were requested to place one badge in their clothing near the belt and the other inside a shoe. These were worn for 40 hours weekly and exposure was determined by densitometer readings according to standard technique.

PRIMARY X-RAY BEAM INTENSITY

Measurements were made directly within the shoe-fitting chamber on 40 machines and by use of the dosimeter r-meter (Victoreen). Exposures were timed for 30 seconds. Table 1 indicates the primary beam dosage of the machines tested. Chart 1 shows the distribution of doses and demonstrates graphically the variation from machine to machine. It will be noted that there was a range from 12 to 107 r per minute, with an average of 38.4 r per minute. Although no tests were made with a customer's foot in the apparatus, these values give a conservative approximation of the range of radiation to which skin and tissue may be subjected. It is of interest here to point out that several shoe salesmen volunteered the information that they frequently placed their hands within the fitting opening to demonstrate to parents and customers the nature of the fit or to place the foot in a more favorable position for viewing while another salesman operated the machine. It would be interesting to determine the actual exposure per customer and the amount of time during which shoe salesmen are subjected to stray radiation during the course of the day. In this study no such measurements were possible except for casual observations which indicated that there was little inclination to be satisfied with a single timed exposure. Some of the machines were set for five seconds and others for 20 to 30 seconds, but these times were frequently found to be insufficient for customer satisfaction. The possibilities for multiple exposure to the direct beam are obvious when one considers the frequency with which some patrons may go from store to store, at each of which there may be several fittings.

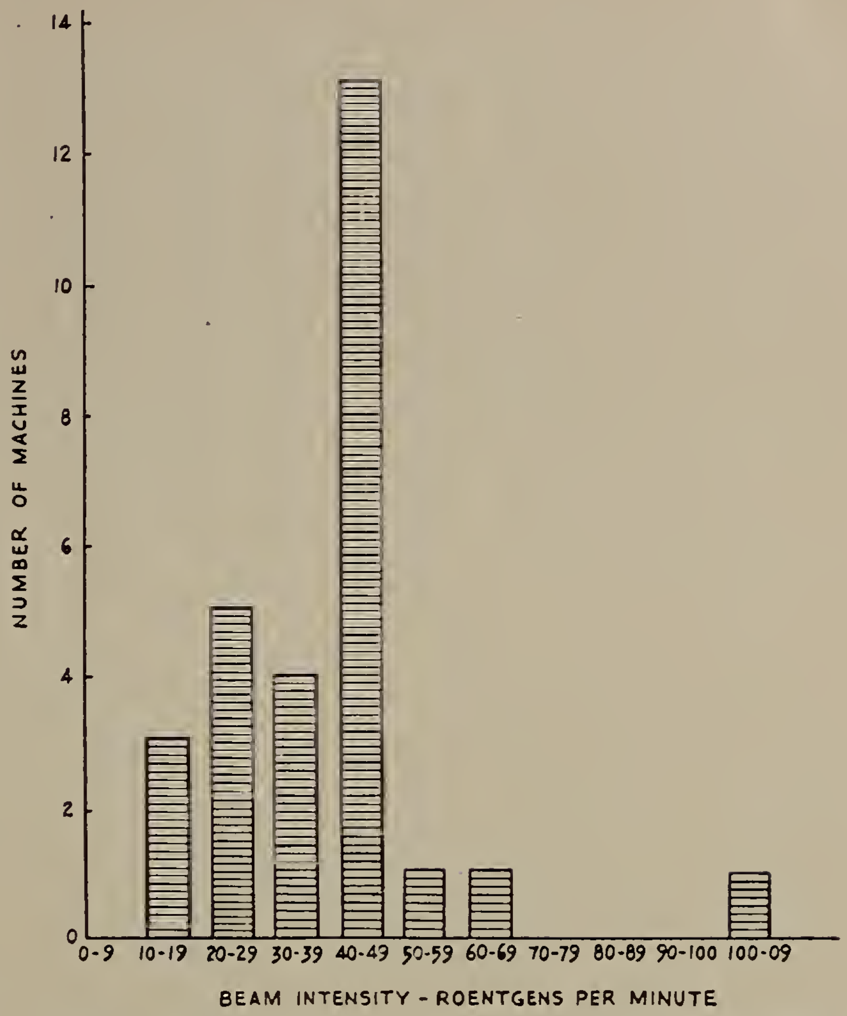


Chart 1.—Distribution of beam intensities in roentgens per minute, measured by placing dosimeter r-meter within shoe-fitting chamber (40 machines).

Table 1.—*Direct Beam Exposure to Foot**
Roentgens per Minute

Mean	Median	Maximum	Minimum
38.4	40	107	12

* Measured with Victoreen dosimeter r-meter within foot opening.

Seventy-seven salesmen cooperated in this part of the study and readings were made of film badges which were worn for one week in each instance. There were several instances in which the film badges were lost or misplaced and these, unfortunately, were usually the film badges placed in the trouser cuffs. Table 2 and Chart 2 indicate the range of dosage in the two parts of the body surveyed. These data are admittedly rough since there were several instances in which it was known that film badges originally placed in the trouser cuff were later placed in the watch pocket and occasionally there were days during which the film badges were not worn at all. This may account for the relatively large number of zero readings reported.

STRAY RADIATION

Chart 3 represents a plan view of a shoe-fitting machine. Points at which measurements were made are indicated by Numbers 1 to 10. The extent of leakage of radiation about the machine is shown in Table 3 for the various positions tested. These observations were made with Victoreen minometer ionization chambers with capacities of 10, 100 and 200 mr. It will be noted that a high degree of scatter was found at the foot opening of the machine and that fairly high values also were obtained when the instrument was placed beside the foot being examined. Although the leaded glass shield usually protected the eyes, there were some instances in which as much as 9 mr per minute was recorded at the viewing point. This was probably attributable to the fact that the leaded glass was not always placed in proper position and leakage occurred around the margin.

DISCUSSION

This investigation was concerned only with the potential hazard of radiation exposure. It has been pointed out by others that the shoe-fitting fluoroscope is an electrical device supplied by a high-voltage current and that the possibility of electric shock is also involved.. In no known instance was adequate maintenance supplied either by the manufacturer or distributor of the machines. Successful continuous operation of the apparatus is dependent chiefly upon the original construction, since most of the shoe store managers were unfamiliar with possible facilities for repair or testing of machines.

Evaluation of the effect of exposure upon salesmen and shoe store clientele must be based upon established levels of x-ray tolerance. The value of 0.1 r per day was widely accepted for x-ray and gamma ray exposure by most official and other agencies until 1949. At present a new value of 0.3 r per week is suggested as a maximum tolerance.[9] This value is admittedly conservative, but is based upon the view that during peacetime every effort should be made to maintain as low an exposure to ionizing radiation as can be achieved.

It appears quite obvious from the data presented that shoe store salesmen in general are not ordinarily subjected to doses beyond tolerance limits. In fact, assuming the reliability of the observations

Table 2.—*Stray Radiation Exposure to Salesmen**

Location	No. of Salesmen	Exposure—mr per week Mean	100 to 300	10 to 100	Not Detectable
In trouser cuff	58	15.0	2	23	33
In watch pocket	74	7.1	0	22	52

* Measured by film badge densitometer technique.

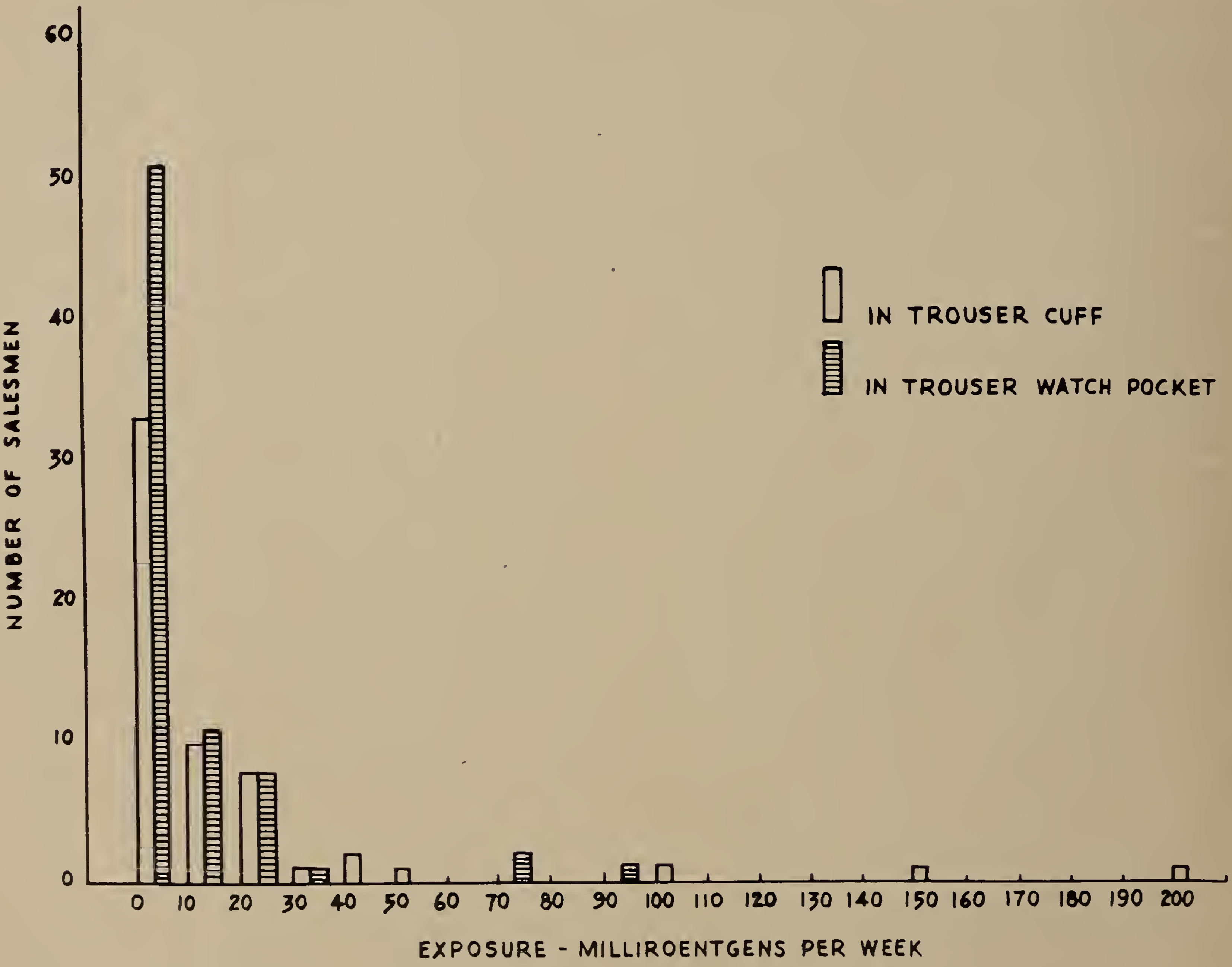


Chart 2.—Range of weekly exposures of shoe salesmen, measured by film badge technique.

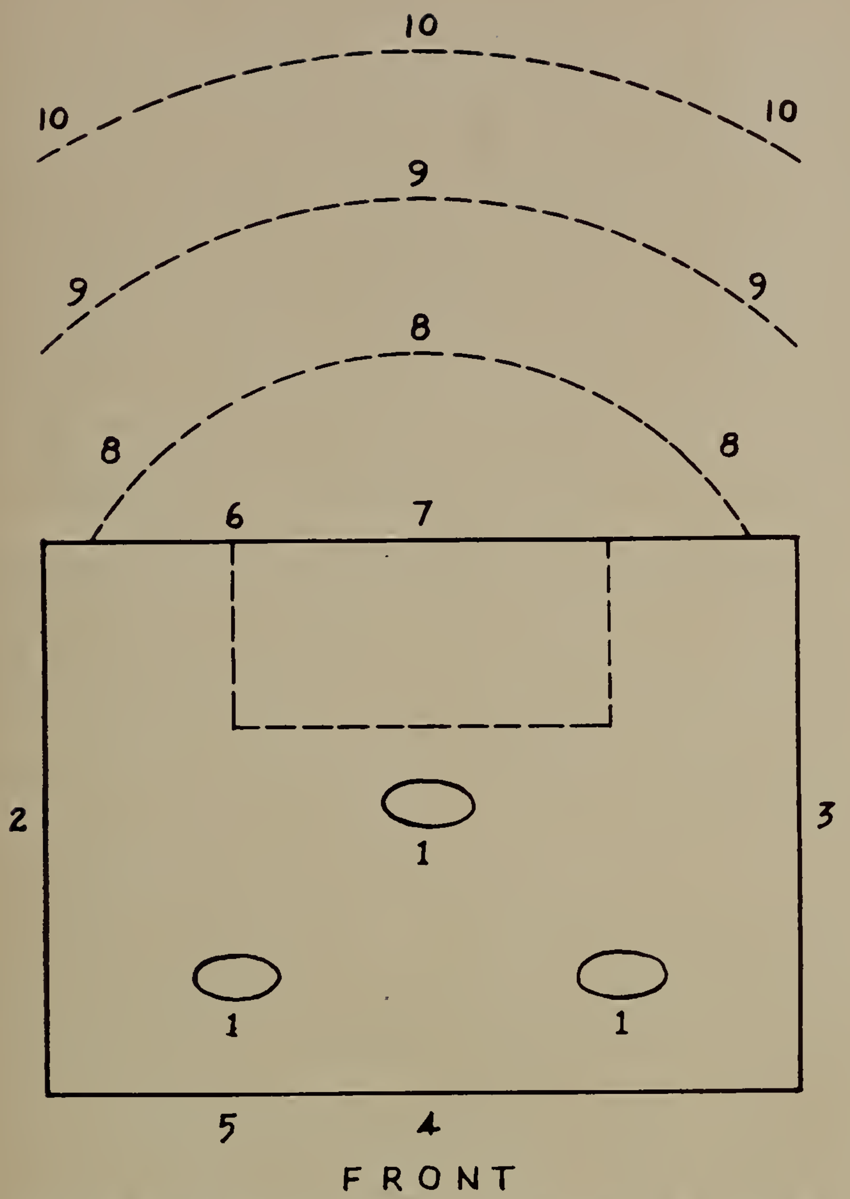


Chart 3.—Plan view of shoe-fitting machine. Numbers refer to points at which stray radiation was measured (see Table 3).

Table 3.—*Stray Radiation Around Machine*

Position (See Chart 3)	Total No. Readings Made	Exposure—mr per Minute of Operation				
		Mean	100-400	10-100	1-10	Not Detectable
1. Eyepieces	24	1.0	0	0	4	20
2. Floor—left side	38	4.1	0	6	6	26
3. Floor—right side	37	1.4	0	1	8	28
4. Floor—front	37	1.9	0	3	8	26
5. Operator's switch	22	3.7	0	4	2	16
6. Beside foot	18	100.0	10	8	0	0
7. At opening	32	247.8	32†	0	0	0
8. 1 ft. from opening	22	60.2	4	18	0	0
9. 2 ft. from opening	22	22.5	0	20	2	0
10. 3 ft. from opening	11	23.4	1	7	3	0
6 ft. from opening	11	3.5	0	1	3	7

* Measured with minometer ionization chamber pencils.
† Readings of 400 mr or above on seven machines.

Table 4.—*X-ray Doses for 20-second Fitting*

Observer	Maximum Dosage (r)	Mean Dosage (r)
Williams[11]	116.0	
A.M.A. Editorial[4]	46.7	
Fredrick and Smith[6]	25.0	14.3
Lewis and Caplan	35.7	12.8

(with the exceptions already noted), most of the salesmen had almost no detectable exposure during the course of a week. Clinical observations were not made but casual inquiry concerning skin effects and other possible radiation injury gave negative results even among salesmen who had used the fluoroscope for as long as five years.

It is equally clear, however, that the customers being fitted usually receive a very substantial dose of radiation. While the feet admittedly represent only a small proportion of the total body tissue, and, therefore, the total dosage may not often be of significance so far as systemic effect is concerned, potentialities for skin damage or injury to the bone structures of a growing foot are undoubtedly present. The American Standards Association[2] has recommended a limit of 2 r per exposure for shoe-fitting machines. On the basis of a 20-second exposure the values reported by various observers would be as shown in Table 4.

It may be anticipated that the suggested limit of 2 r per fitting will usually be greatly exceeded in practice. However, evaluation of hazard should depend upon more than an arbitrary limit, and evidence of potential harm must be more thoroughly considered.

According to Ellinger,[5] "On the basis of present knowledge it must be assumed that depth doses of 150 r in infants and 300 r in children are capable of causing growth disturbances." There is good evidence that the epiphyses, rather than the shafts of bones, are the susceptible areas. The potentialities for damage are quite clear when a single 20-second exposure to the shoe-fitting machine may exceed one-third of the hazardous dose for children.

Aside from specific epiphyseal damage, there is another consideration which must arise in any radiation exposure. Lapp and Andrews[8] point out: "Whatever the permissible exposure may be, all workers must recognize that any amount of radiation is potentially dangerous and should be avoided . . . Present evidence indicates that at least some radiation injuries are statistical processes that do not have a threshold. If this evidence is valid, there is no exposure which is absolutely safe and which produces no effect." This point of view is thoroughly supported by recently reported observations that the incidence of cancer among exposed mice begins to rise with the lowest measurable dosage of ionizing radiation. It would seem advisable, therefore, that voluntary exposure should be limited to cosmic radiation, essential diagnostic radiography and natural or induced environmental sources of radioactivity.

CONCLUSION

The shoe-fitting fluoroscope is not an instrument with obviously hazardous potentialities. It has long been used and no direct clinical evidence of harm has yet been established. However, any x-ray apparatus represents a source of insidious harmful radiation, the use or abuse of which may lead to significant damage, often without recognition of clearcut causal relationship.[7] The early history of the use of diagnostic x-irradiation without precaution and the subsequent appearance of skin and neoplastic changes after years of latency should provide adequate warning against careless exposure to any source of ionizing radiation.

Sufficient information has now been accumulated to prove that the fluoroscopic shoe-fitting machine represents a potential, if not obvious, hazard. The question which must be answered by health authorities is whether these machines should be subjected to strict regulation or eliminated entirely. The answer to this question depends in part upon a consideration of the usefulness of the devices. If fluoroscopy is essential to shoe fitting, its use can probably be rendered safe. This will necessarily involve training of personnel and frequent inspection, the efficacy of which is always limited. In this connection it is interesting that of the 77 salesmen interviewed at least half were of the opinion that the machine was not of use in scientific shoe fitting. Most of them were of the opinion that it was chiefly useful for sales promotion and only a small minority favored its use for more satisfactory fitting, particularly of children. In several instances shoe-fitting machines were found in shops where they had long been relegated to disuse.

No attempt will be made to settle the issue of policy, the determination of which should lead to proper action on the part of public health or governmental industrial hygiene agencies. (See resolution adopted by the American Conference of Governmental Industrial Hygienists.[1]) If regulation is the procedure of choice, the "requirements for the safe operation of fluoroscopic shoe-fitting devices" incorporated in the article by Fredrick and Smith[6] are recommended for consideration.[*] In order to operate at the suggested value of 12 r per minute, however, it will be necessary that machines be maintained in good order. The lower intensities suggested for women and children are advisable but the difficulty of supervising proper use of a graded scale of exposure must not be underestimated.

Although, as has been stated, no attempt will be made here to resolve the basic question of policy, the arguments in favor of elimination of the shoe-fitting fluoroscope can be very simply stated. The difficulties of inspection and maintenance are well known to safety and health agencies. Machines inspected today may be modified by removal of screens or filters and rendered extremely hazardous tomorrow. Furthermore, the most extensive set of regulations will not prevent careless exposure of the hands, excessive irradiation of the growing child's foot, or other improper use since it is difficult to establish fear of a harmful material as intangible as an x-ray. In view of the probability of improper use and because of uncertain knowledge as to the danger of cumulative small dosage of x-ray, it is clear that a very good case can be made for the removal of these devices from commercial shoe stores. This is particularly true in view of the lack of proof of their merit as scientific devices for fitting shoes.

REFERENCES

1. American Conference of Governmental Industrial Hygienists: Resolution adopted by A.C.G.I.H. on x-ray shoe-fitting machines, Indust. Hyg. Newsletter, 9:4, June 1949.

2. American Standards Association: Safety Code for Industrial Use of X-rays, A.W.S. Z54.1. New York: The Association, 1946.

3. City of New York, Sanitary Code: Section 107a, Shoe fitting fluoroscopy (effective March 1, 1948).

4. Editorial: Shoe fitting fluoroscopes, J.A.M.A., 15:1004-05, April 9, 1949.

5. Ellinger, F.: The Biological Fundamentals of Radiation Therapy. New York: Elsevier Publishing Co., 1941, p. 36.

6. Fredrick, W. G., and Smith, R. G.: Health problems of x-ray shoe fitting, Am. Indust. Hyg. Assoc. Quarterly, 9:89-93, December 1948.

7. Hempelmann, L. H.: Potential dangers in the uncontrolled use of shoe-fitting fluoroscopes, New England J. Med., 241:335-36, September 1, 1949.

8. Lapp, R. E., and Andrews, H. L.: Nuclear Radiation Physics. New York: Prentice-Hall, 1948, p. 437.

9. National Bureau of Standards, U. S. Department of Commerce: Medical X-ray Protection up to Two Million Volts, Handbook No. 41. Washington: Govt. Print. Office, 1949.

10. Williams, C. R.: Radiation exposures from the use of shoe-fitting fluoroscopes, New England J. Med., 241:333-35, September 1, 1949.

11. Williams, C. R.: Radiation hazards in industry, J. Indust. Hyg. & Toxicol., 30:294-99, September 1948.

* * *

---

[*] On March 1, 1948, "Regulations Governing the Operation and Maintenance of Apparatus Used for Shoe-Fitting Fluoroscopy" became effective under the sanitary code of the City of New York.[3] These specify a maximum permissible dose of 2 r per exposure, limit the number of exposures to three per day and 12 per year. Stray radiation exposure of employees is not to exceed 12.5 mr per hour.

The Detroit department of health requirements[6] are in general comparable to those of New York, but, instead of specifying dosage per exposure, permit a direct beam intensity maximum of 12 r per minute for five seconds (less for women and children) and a maximum of five fittings per day and 20 per year. At 12 r per minute, five fittings of five seconds each result in a dose of 5 r.

Coccidioidin Skin Testing During Pregnancy and in Infants and Children

ROBERT COHEN, M.D., and ROBERT BURNIP, M.D., *Bakersfield*

SUMMARY

Results of a study of 220 newborn infants in an endemic area indicate coccidioidal infection is not transmitted congenitally.

Skin testing of 595 infants and children disclosed that coccidioidal infection may be acquired at a very early age—as early as one month. The children tested were divided into various age groups, and the incidence of infection increased gradually from the lowest age group to the highest.

THIS presentation has a twofold purpose, the first to consider the possibility of discovering coccidioidal infection in newborn infants in an endemic area, the second to consider the earliest average age at which the first positive reaction to a coccidioidin skin test may be obtained. The latter is also to bridge a gap that Gifford[5] and Thorner[13] did not cover in their studies.

Coccidioidin skin tests have been carried out by such investigators as Smith,[10,11] Gifford,[5] Thorner[13] and others[1,2,4,7,8] in the San Joaquin Valley endemic area. The tests were made for various purposes—to determine coccidioidin sensitivity ratios among children and adults in the area, to discover new cases, and to investigate epidemiological problems. Gifford,[5] in a study on preschool and school children, found positive reactions in over half of the 2,718 children tested. This percentage increased progressively from 17 per cent among children who had lived in Kern County less than one year to 77 per cent among those who had lived in this vicinity for ten years or more. Gifford[6] also found in testing the inmates of the old people's home in Kern County that 90 per cent had positive reaction to coccidioidin. Persons in this group had lived in the southern San Joaquin Valley a minimum of 20 years.

Reviewing the literature as spadework for the present study, the authors were surprised to find only one report of a case of coccidioidal infection in an infant.[9]

Opportunity to study the possibility of congenital coccidioidal infection was given the authors when they attended two newborn babies whose mothers had coccidioidal meningitis. One of the mothers was a Negro who was delivered of a premature infant, the other was Caucasian and delivery was at term. Blood and spinal fluid from both of the mothers and both infants were sent to Stanford University School of Medicine for complement fixation and agglutination tests.

Results of tests of the Negro mother were:

Serological Test

Serial Dilutions of Serum (0.25 cc.)						
1:2	1:4	1:8	1:16	1:32	1:64	1:256
+++++	++++	++++	++++	++++	+++	+

Precipitin Tests

Serial Dilutions of Antigen			
Undiluted	1:10	1:40	1:100
++++	+++	+++	

The conclusion reported was: "The findings were characteristic of progressive disseminated coccidioidal infection (coccidioidal granuloma). The presence of precipitins indicated recently acquired infection."

Results of serological tests of the infant were:

Blood: Complement Fixation Test

Dilution		
1:2	1:4	1:8
+++	+	0

Spinal Fluid: Complement Fixation

Dilution		
1:2	1:4	1:8
±	0	0

Blood and spinal fluid precipitins hemolyzed

Conclusion: "It is uncertain whether the complement fixation is regressive from passive transferred humoral antibodies from the mother or whether the infant might have congenital infection—a condition which we have never seen."

Results of tests of blood and spinal fluid drawn from the white mother just before delivery were:

Complement Fixation

	Dilution							
	1:2	1:4	1:8	1:16	1:32	1:64	1:126	1:256
Serum	±	0	0	0	0	0	0	0
Spinal fld.	0	0	0	0	0	0	0	0

Precipitin Tests

	Serial Dilutions of Antigen		
	Undiluted	1:10	1:40
Serum	++++	0	0
Spinal fluid	0	0	0

The conclusion was: "We could not elicit complement fixation but precipitins were present. In all likelihood the extent of meningeal involvement is small."

Two months later results of spinal fluid complement fixation tests were positive up through 1:16

dilutions and the precipitins positive to 1:40 dilution.

Results of tests of blood drawn from the umbilical cord:

Complement Fixation

Dilution							
1:2	1:4	1:8	1:16	1:32	1:64	1:128	1:256
+	0	0	0	0	0	0	0

Precipitin Tests

Serial Dilutions of Antigen		
Undiluted	1:10	1:40
0	0	0

Conclusion: "Unfortunately, from the scientific point of view, the titer of the mother's blood is very low. The infant seems to have the same titer in the cord blood, but it is so low as to be of doubtful diagnostic significance."

One month later a second sample of the infant's blood was sent to Stanford for recheck. Tests of the new sample and of the specimen previously sent were done simultaneously.

	1:2	1:4	1:8	1:16	1:32	1:64	1:128	1:256
Previous specimen	++++	+	±	0	0	0	0	0
New specimen	±	0	0	0	0	0	0	0

Precipitin Tests

Serial Dilutions of Antigen			
Undiluted	1:10	1:40	1:100
Hemolyzed			

Conclusion: "This test was slightly tighter and the second test of the previous specimen showed definitely positive reaction. However, the reaction to test of the new specimen was negative, suggesting that the passive transfer of humoral antibodies in cord blood had worn off. Certainly there was no evidence of congenital infection."

The results of coccidioidin skin tests were negative for both infants in dilutions of 1:100 and 1:10. The premature infant died and necropsy did not reveal coccidioidal infection. The placental tissue was also free of coccidioidal infection. The full term infant lived and when last heard of was doing well.

One of the authors[3] reported coccidioidal infection in an infant, the youngest of record to have such infection. In that case swelling of a finger was noted in the second week of life, and a slight cough had been present from birth. The swelling was cause by coccidioidal dactylitis which was proved by culture and by examination of sections. In addition, a pulmonary cavity was noted. At 13½ months of age the child was observed again and the cavity seemed to be enlarging. A complement fixation test was positive for coccidioidal infection in a dilution of 1:128. The mother had had San Joaquin fever during pregnancy, but at that time the possibility of congenital infection had not been considered, so had not been investigated.

The authors did coccidioidin skin tests on 102 women immediately before or soon after they were delivered of babies. One-half of the tests were done in the delivery room and the other half in the patients' rooms within the first 24 hours after delivery. The average length of time that these mothers had lived in the San Joaquin Valley was nine and three-quarters years. Among the 102 women tested, 48 (47 per cent) showed positive reaction.

With this result taken to indicate that there would be a comparable incidence of coccidioidal infection in other pregnant women in the area, routine coccidioidin skin tests were done on every newborn in the Kern General Hospital in the fall of 1948. The material used was in dilution of 1:100, and 0.1 cc. was injected intradermally into the right forearm. The reactions were observed 24, 48, and 72 hours later. (Smith's[12] rule was used for appraising the reactions.)

In all, 220 newborns were tested. In 110 cases the test material was injected within the first 24 hours after birth, and in the remaining 110 the injections were made in the second 24-hour period. Erythematous reactions were noted in 40 per cent of both groups 24 hours after injection, but at the end of 48 hours erythema had disappeared. In only one case in each group did induration persist for 48 hours after injection—a positive reaction. But in these two cases x-ray studies of the lungs disclosed no abnormality.

In an attempt to find the average earliest age at which infants and children might first show positive reaction to coccidioidin skin tests, skin tests were carried out on 312 children in the pediatric ward and 283 in the clinics, a total of 595, ranging in age from one month to 13 years. Results are shown in Table 1.

TABLE 1.—*Positive Reaction According to Age Group Among 595 Children Tested with Coccidioidin*

Age		Positive Reaction	
Months:	1	1	
	2	1	
	3	3	
	5	1	
	7	1	
	9	1	
	12	1	
	13	1	
	18	3	
	24	5	
	Total	18	*(3% of Total)
Years:	2-3	5	
	3-4	7	
	4-5	9	
	5-6	12	
	6-7	9	
	7-8	11	
	8-9	8	
	9-10	11	
	10-11	10	
	11-12	11	
	12-13	2	
	Total, 2 to 13 years	95	*(15% of Total)

* Of the total of 113 children with positive reactions, 90 per cent had lived in Kern County all their lives.

Kern General Hospital.

REFERENCES

1. Aronson, J. D., and Gallagher, J. R.: Sensitivity to coccidioidin among boys in an eastern preparatory school, Amer. J. Pub. Health, 3:636-639, June 1942.

2. Cheney, G., and Denenholz, E. J.: Observations on the coccidioidin skin test, Mil. Surg., 96:148-156, Feb. 1945.

3. Cohen, R.: Coccidioides case studies in children, Arch. Ped., June 1949.

4. Dickson, E. C., and Gifford, M. A.: Coccidioides infection (coccidioidomycosis). II. The primary type of infection, Arch. Int. Med., 62:853-871, Nov. 1938.

5. Gifford, M. A.: Coccidioidomycosis in Kern County, California, Proceedings Sixth Pacific Sci. Cong., Vol. V., Aug. 1939.

6. Gifford, M. A.: Personal conversation, 1949.

7. Goldstein, D. M., and Louie, S.: Primary pulmonary coccidioidomycosis, report of an epidemic of 75 cases, War Med., 4:299-317, Sept. 1943.

8. Haynes, D. M., and Hess, W. I.: Cutaneous test with coccidioidin. Review of the literature and a report of a series in Texas, J. Lab. & Clin. Med., 31:1317-1324, Dec. 1946.

9. Porter, G. S.: Coccidioidal Granuloma, Special Bull. No. 57, Calif. Dept. Health, Calif. State Printing Off., Sacramento, 1931.

10. Smith, C. E.: The epidemiology of acute coccidioidomycosis with erythema nodosum ("San Joaquin" or "valley" fever), Amer. J. Pub. Health, 30:600-611, June 1940.

11. Smith, C. E.: Recent progress in pulmonary mycotic infections, Calif. Med., 67:179-185, Sept. 1947.

12. Smith, C. E., Whiting, G. E., Baker, E. E., Rosenberger, H. G., Beard, R. R., and Saito, M. T.: The use of coccidioidin, Amer. Rev. Tuber., Vol. 57, April 1948.

13. Thorner, J. E.: Coccidioidomycosis; relative values of coccidioidin and tuberculin testing among children of San Joaquin Valley, Calif. & West. Med., 54:12-15, 1941.

* * *

Gentleman and Scholar

On a recent visit to Goettingen, the seat of the venerable Georg-August University, I met the renowned pathologist, Gg. B. Gruber, who formerly held the chair of pathology at the university, and is now retired. He told me the following story: In April 1945, when the American troops entered Goettingen, an American medical officer entered the Pathological Institute looking for a place to billet his men. He examined every room in the Institute, and was attracted by the gallery of pictures of pathologists. When he noticed among these a picture of Rudolph Virchow, he said: "A house in which the picture of Rudolph Virchow hangs, whom we Americans admire not only as a scientist but also as a democrat, shall not be occupied by the military." He gave a brisk military salute, and left. The Pathological Institute of Goettingen remained unoccupied.

Robert Wartenberg, M.D.

Tracheotomy in Bulbar Poliomyelitis

Alden H. Miller, M.D., and Leonard S. Buck, M.D., *Los Angeles*

SUMMARY

Tracheotomy was performed on 181 of 351 patients with bulbar poliomyelitis. The essential indication for tracheotomy was secretional obstruction of the respiratory tract that could not be relieved by postural drainage and aspiration.

Comparison of mortality rates in this series with those of previous series in which tracheotomy was not done in the presence of similar indications, suggests that the procedure may be life-saving in a considerable percentage of cases.

Outside the respirator the tracheotomy can be done with or without the aid of the bronchoscope or endotracheal anesthesia tube. When done inside the opened respirator the Bennett flow-sensitive positive pressure machine should be used to supply oxygen to the patient while the respirator is not operating.

TRACHEOTOMY seems to have been used first in the treatment of poliomyelitis in 1931. Wilson[11] reported using it successfully at that time in a number of patients with pharyngeal paralysis in preventing choking attacks and aspiration of secretions into the bronchial tree. Davison[3] in 1936 stated that tracheotomy might be necessary in bulbar poliomyelitis. Galloway[4] in 1943 reported that tracheotomy was life-saving in two of three patients with poliomyelitis and respiratory difficulty not relieved by postural drainage or aspiration of secretions incapable of being swallowed. In 1945 Nelson-Jones[8] and Williams reported the use of tracheotomy in one case of bulbar poliomyelitis and Glaser[6] also reported its use in a small number of cases. During these years tracheotomy seems to have been used only in a relatively small number of patients and then only rather late in instances of severe secretional obstruction of the airway. However, in the 1946 epidemic in Minneapolis, Priest[9] reported on the use of tracheotomy in 75 of approximately 400 cases of bulbar poliomyelitis. In this series tracheotomy was used not only as a lifesaving measure but as a prophylactic procedure to prevent anoxia, atelectasis and pneumonia. Of the 75 patients tracheotomized, 29 survived, and of these 19 seemed to owe their lives directly to tracheotomy.

As a result of the successes in that large series, tracheotomy was performed on 14 of the 129 patients with bulbar poliomyelitis treated in the communicable disease unit of the Los Angeles County General Hospital during 1946. Seven of the 14 died. Eight tracheotomies were performed in 1947 and four of the patients died, but in the severe epidemic of 1948 more than 200 tracheotomies were performed in this hospital in a series of more than 600 patients with bulbar poliomyelitis.

During 1948 there were 3,135 cases of poliomyelitis in Los Angeles County with a mortality rate slightly over 4 per cent. The Los Angeles County health officer reported that there were 600 patients with the bulbar type of the disease; 280 of them required respirator care and 230 of them needed tracheotomy, making this the most serious as well as largest epidemic in the history of the country. The authors reviewed the records of 388 of the cases of bulbar poliomyelitis in this series. In this group 198 patients (51.0 per cent) received tracheotomy. Experiences and results in these cases form the basis for this presentation, which is made in an attempt to outline indications for and technique of performing tracheotomy in bulbar poliomyelitis.

INDICATIONS

Secretional obstruction of the respiratory tract is the outstanding indication for tracheotomy. Early in bulbar poliomyelitis, paralysis of the 9th and 10th cranial nerves results in secretions pooling in and obstructing the larynx because of the inability of the patient to swallow the secretions. Interference with the innervation of the larynx and increased secretions are additive factors. Early symptoms indicating bulbar polioymelitis are a weak or nasal voice and difficulty in swallowing. It is of interest that a very large number of the patients in this series also had early unilateral facial paralysis. Of course, many times the pooled secretions can successfully be aspirated by suction, but when the patient, despite suction, has periods of choking in which he becomes restless, irritable, apprehensive, or slightly cyanotic, tracheotomy is indicated.

Sometimes the patient is already comatose and cyanotic when first observed, because the secretions in the larynx and upper trachea are so great and thick that air cannot be drawn through them. In such cases immediate tracheotomy often permits successful aspiration of the secretions with prompt recovery from anoxia.

In another classification are patients in whom pooling of secretions is insufficient to cause laryngeal obstruction but in whom there is clinical or x-ray evidence indicating development of atelectasis, pneumonia, or pulmonary edema as a result of abnormal amounts of secretion in the lower airways. This pooling of secretions in the trachea and bronchi may result from the inability to cough and the loss

---

From the Department of Otolaryngology of the School of Medicine of the University of Southern California and the Services of Otolaryngology and Communicable Disease Division of the Los Angeles County General Hospital.

Presented before a Joint Meeting of the Sections on Eye, Ear, Nose and Throat, Obstetrics and Gynecology, Pediatrics, and Public Health at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

of tussive squeeze because of paralysis of the intercostal muscles and the diaphragm. Furthermore, pulmonary edema and bronchial hypersecretion are a part of poliomyelitis. The development of this situation is an indication for early tracheotomy in order that the tracheobronchial tree may be kept aspirated free of secretions.

Tracheotomy is frequently indicated for the patient who is already in a respirator, because the negative pressure created by the respirator in its inspiratory phase tends to pull the secretions downward from the larynx and thus cause atelectasis or "drowning in the patient's own secretions." The intrathoracic negative pressure is increased on inspiration by any obstruction at the laryngeal level either because of pooled secretions or vocal cord paralysis. Thus tracheotomy is indicated to afford safe aspiration of these secretions and to by-pass the laryngeal obstruction causing the increasing negative inspiratory pressure.

Because of this action by the respirator, in the past many patients with bulbar poliomyelitis who developed respiratory difficulty because of intercostal and diaphragmatic paralysis could not survive if placed in the respirator. Here, then, is another indication for tracheotomy; that is, in the patient with bulbar poliomyelitis who up to a point has not been distressed by secretions, but who ultimately must be placed in a respirator.

TECHNIQUE

Tracheotomy for a patient with bulbar poliomyelitis is a complicated procedure if the patient is already in a respirator or if it is necessary that he be placed in a respirator immediately following this operation. Of 198 tracheotomies in the present series, 140 were done outside the respirator. Fourteen were done in an opened respirator, with an endotracheal anesthesia tube supplying oxygen from a manually operated anesthesia bag. The other 44 operations were performed in the opened respirator with a Bennett flow-sensitive positive pressure machine being substituted for breathing.

If the patient has never been in a respirator, tracheotomy is performed in the usual manner over a bronchoscope. Especially should the bronchoscope be used if the patient is a child. This technique should be used in most prophylactic or early tracheotomies.

If the tracheotomy is performed outside the respirator upon a patient who is to be placed in the machine immediately afterwards, the operation should be done over an endotracheal anesthesia tube or with the Bennett flow-sensitive positive pressure machine and mask supplying oxygen until the respirator can take over.

If the patient is already in a respirator and cannot breathe well enough or long enough to permit carrying out tracheotomy with the respirator turned off and opened up, the following techniques utilizing the Bennett positive pressure machine seem to be best:

1. Using the positive pressure mask, the patient can be pulled far down into the opened respirator but with the head still outside. With this technique, after tracheotomy the neck must be pulled up through the collar and the respirator closed and turned on as soon as the trachea is opened.

2. The patient's body, including the head, may be pulled down inside the opened respirator and the positive pressure mask applied through the collar opening of the respirator. As soon as the trachea is opened the positive pressure machine mask is removed and the oxygen tube attached directly to the tracheotomy tube and positive pressure continued. The patient's head and neck may then be drawn through the collar opening. This method seemed better to the authors and was the standard technique used in performing tracheotomies during the last part of the epidemic. Three strips of 3-inch flannel "soft restraint" material were used to roll the rubber collar of the respirator outward.

If the positive pressure machine did not keep the patient pink, the endotracheal anesthesia tube and oxygen breathing bag were substituted for it. This was occasionally necessary for patients with vocal cord paralysis or with acute laryngeal spasm.

The incision into the trachea itself should always be placed rather high in order to facilitate changing and cleaning of the tracheotomy tube and dressing the tracheotomy wound. The ideal site, in the authors' opinion, is the second tracheal ring. This ring almost always lies beneath the thyroid isthmus. Therefore, severance of the isthmus always should be planned. It was noted many times that the isthmus was swollen and congested.

A metal flange constructed to hold the rubber collar down and away from the tracheotomy wound makes care of the wound easier. Attempts to perform the tracheotomy outside the closed respirator with this flange in place were uniformly unsatisfactory, difficult and dangerous.

The tracheotomy tube used should be of the largest possible size, for two reasons: (1) in order that secretions may flow easily and without crusting, (2) to minimize the possibility that the tube might itself have the effect of tracheal obstruction and thus cause increased intrathoracic negative pressure during the inspiratory phase of the respirator.

POSTOPERATIVE CARE

Complete, detailed discussion of postoperative management of the tracheotomized patient in a respirator has been presented by West and Bower.[10] The respirator may be tipped head down for short intervals. Gentle suction with small rubber catheters with multiple openings is used through the tracheotomy tube to keep the airway cleared of secretion. Should the patient become cyanotic despite this suctioning, bronchoscopy through the tracheotomy is performed, repeatedly if necessary. Oxygen, bubbled through cool water, is allowed to flow into the tracheotomy tube at a rate of 2 to 3 liters per minute. Fluids are given at first intravenously and later by Levine tube into the gastrointestinal tract.

AUXILIARY POSITIVE PRESSURE MACHINE

Early in the epidemic the attending and resident staff of the communicable disease service noted that many of the tracheotomized respirator patients did not do as well as expected. That is, they did not seem to get enough air on inspiration, and repeated aspiration through the tracheotomy tube and even bronchoscopic aspiration did not control the presence of excessive secretion in the tracheobronchial tree. Thus atelectasis, pneumonia or pulmonary edema often resulted, sometimes causing death. It was theorized that in the tracheotomized patient the respirator did not create inspiratory aeration sufficient to combat the edema and hypersecretion present. Presented with the problem, a consulting engineer devised and built a machine which delivered air, oxygen or gaseous mixtures under positive pressure during inspiration through the tracheotomy tube.

Other investigators (Glaser,[6] Baker,[1] and Kubicek[7]) have described the use of oxygen under positive pressure during expiration, but clinical observation and a lessened mortality rate after the Bennett[2] positive pressure machine was routinely used proved the advantages of giving oxygen under positive pressure during inspiration, both in preventing hypoxia and in reducing bronchial secretions. The machine is so designed that on each expiration it is turned off so that the patient does not exhale against pressure. This mechanism is attached directly to the respirator so that its bellows contract as the respirator bellows expand; that is, positive pressure is applied through the tracheotomy tube during the inspiratory phase of respirator action. A portable flow-sensitive Bennett positive pressure machine with either face mask or an attachment for the tracheotomy tube was also constructed. This machine has an expiratory phase also, in which negative pressure is produced in the mask. It differs from other resuscitators, in that it is "flow-sensitive," that is, it cuts off automatically when the patient breathes for himself. This machine was used to breathe for the patient while the respirator was open and turned off to permit the placing of a tracheotomy tube.

RESULTS

Mortality: In the total of 388 cases of bulbar poliomyelitis reviewed, there were 101 deaths—28.8 per cent. Seventy-seven of these deaths were in the group of 198 patients who received tracheotomy. Thus there was a 38.8 per cent mortality rate in the tracheotomized group.

Complications: In the 198 tracheotomized patients there was one case of mediastinal emphysema and two cases of pneumothorax. There was troublesome bleeding from the tracheotomy wound in three patients, one of whom was receiving heparin.

Decanulization: The tracheotomy tube was usually not removed until the patient could swallow adequately. The average time for the return of adequate swallowing was 21½ days. The longest time for the return of swallowing and thus the removal of the tracheotomy tube was four and one-half months. However, many patients had a return of swallowing the day following the placing of the tube.

Stenosis: There was no instance of laryngeal stenosis occurring in this group of patients.

COMMENT

The total mortality rate of 28.8 per cent in this series of 388 cases of bulbar poliomyelitis seems gratifyingly small when compared to mortality rates in bulbar poliomyelitis in other epidemics. Inasmuch as in this epidemic tracheotomy was performed in 198 cases or 51.0 per cent of the patients with bulbar poliomyelitis, and since this procedure was the only major way in which treatment differs in this and previous epidemics, it is believed that early tracheotomy performed upon the previously mentioned indications was a great factor in lowering the death rate. Certainly those who performed the tracheotomies were convinced that many of the patients would have died of anoxia, atelectasis, pulmonary edema, or pneumonia if tracheotomy had not been done.

The staff members who were in constant attendance on these patients had a much better opportunity than the otolaryngologist to evaluate tracheotomy. Not only were they sure of its life-saving value, but almost all of the tracheotomies were done at their request upon their evaluation of the indications present. Two of the staff who saw all the cases (Bower and West) concluded that early tracheotomy cannot be over-stressed in the management of acute bulbar poliomyelitis and that this treatment saved at least half of the patients of a type who previously died.

500 South Lucas Avenue.

REFERENCES

1. Baker, A. B.: Bulbar poliomyelitis: Its diagnosis and treatment, Ill. Med. Jour., 92:160, September, 1947.

2. Bennett, V., Consulting Engineering, Los Angeles County General Hospital.

3. Davison, W. C.: Poliomyelitis, Am. J. Dis. Child., 52:1158, 1936.

4. Galloway, T. C.: Tracheotomy in bulbar poliomyelitis, J.A.M.A., 123:1096, Dec. 25, 1943.

5. Gilbert, R. O.: Polio Experience in Los Angeles County, Bull. L. A. Co. Med. Assoc., 79:477, May 5, 1949.

6. Glaser, D. F.: Tracheotomy in Bulbar Poliomyelitis, J. Ped., 27:510, Dec. 1945.

7. Kubicek, W. G., et al.: Oxygen therapy in poliomyelitis, Arch. Phys. Med., 29:217, April 1948.

8. Nelson-Jones, A., and Williams, R. H.: Tracheotomy in bulbar poliomyelitis, Lancet, 1:561, May 1945.

9. Priest, R. E., Boies, L. R., and Goltz, N. F.: Tracheotomy in bulbar poliomyelitis, Ann. O. R. & L., 56:250, June 1947.

10. West, H. E., and Bower, A. G.: Treatment of poliomyelitis involving the respiratory system, Am. Jour. Med. Sc., 217:252, March 1949.

11. Wilson, J. L.: Acute anterior poliomyelitis, New Eng. J. M., 206:887, April 1932.

12. Wilson, J. L.: The use of the respirator (Symposium on Poliomyelitis), J.A.M.A.. 117:278, July 26, 1941.

Surgical Management of the Injured Large Bowel

SAMUEL GENDEL, M.D., *Anaheim*

SUMMARY

Many of the observations made in the management of large bowel injuries during World War II are applicable to similar cases encountered in civilian practice.

Early administration of whole blood to combat shock cannot be overemphasized.

The patient should be adequately examined for associated injuries.

Ether-oxygen is the anesthetic agent of choice, and a closed technique should be used.

Vertical incision offers the best exposure for the operation and is most rapidly performed.

The surgical principles of exteriorization and/or a proximal colostomy to completely divert the fecal stream are the important features in the technical management of the injured large bowel.

A method of colostomy closure is presented.

EXPERIENCES gained in the last war have served to crystallize current knowledge of the surgical management of the injured large bowel. The present surgical concept in the management of patients with such injuries comprises proper treatment of shock, which is present in most cases, adequate postoperative care with judicious use of chemotherapeutic and antibiotic agents, and the employment of the surgical principle of exteriorization of the injured segment of bowel.[6] Comparison of mortality rates in the first World War with those of the second gives a striking example of the effectiveness of this course of management. Penetrating wounds of the colon in World War I caused death in 45 per cent of cases. In World War II, in which many of the wounds were caused by more destructive missiles, the mortality rate was between 15 and 20 per cent.[7]

Preoperative Management. Intra-abdominal injuries due to penetrating or perforating wounds almost always are attended by shock of various degrees. This must be combated early. While plasma is beneficial, whole blood is far more efficacious. Certainly if there is continuing hemorrhage or advancing peritonitis, satisfactory response to blood transfusions is not obtained, and the surgeon is forced to proceed with the operation.[5] He must then rely on support of the patient by transfusions during and after operation. The blood pressure of the patient, although one of the least valuable gauges of impending shock, is one that is frequently used for that purpose. A far more reliable guide is hematocrit measurement, for hemoconcentration occurs before the fall of blood pressure and is thus an earlier index of impending shock.

Nasogastric intubation, with removal of gastric contents, is an important measure to prevent the aspiration of this material during anesthesia. If passage of the tube provokes vomiting, that is fortunate. Testing of the nerve function of the extremities, and a rectal examination to determine the presence of fresh blood, indicative of injury to the rectum, are two of the most commonly overlooked procedures in the preoperative examination.

Anesthesia. Ether-oxygen for anesthesia, with a closed system and preferably use of an intratracheal tube, is the method of choice. Supplemental block of the field either by local infiltration or the injection of the lower intercostal nerves in the axillary line may minimize the necessity for carrying the patient into the deeper levels of anesthesia.[6] Facilities should be available for bronchoscopy if there is reason to believe that gastric contents may have been aspirated into the tracheobronchial tree. Postoperative pneumonia caused by aspiration of such material ranks with peritonitis as a life-endangering complication.

Incisions. In the acute case, the vertical paramedian incision affords the most useful approach and is least liable to complications. Fecal contamination of the peritoneal cavity is usually reflected by postoperative infection of the abdominal wall.[4] When conditions permit, it is preferable to close the peritoneum and posterior rectus sheath in one suture line. The remainder of the abdominal wall is loosely approximated, preferably with stay sutures of braided silk, cotton, or wire. The skin is left unsutured. The provision of adequate drainage of the abdominal wall incision, the avoidance of buried sutures and ligatures, and a loose rather than taut approximation of the stay sutures, are the most effective measures in the prevention of infection and postoperative hernia. While incisional hernias are not within the scope of this presentation, these were observed frequently when wounds broke down because of improper suture. Therefore abdominal closure without the use of buried catgut sutures should be emphasized. The meticulously closed abdominal incision, while cosmetically pleasing, is fraught with danger of sepsis of the wound and subsequent dehiscence.

When it is necessary to exteriorize segments of bowel or to provide intraperitoneal drainage for, or in anticipation of, localized sepsis or a fecal fistula.

Presented before the Section on General Surgery at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

secondary incisions are made. These are short, laterally placed incisions that follow the direction of the fibers of the external oblique muscle.[4] In the upper abdomen, incisions for the exteriorization of bowel must not impinge on the costal arch, for that would make closure difficult.

Management of the Injured Colon. One of the great contributions to surgical management of the injured large bowel has been the recognition of the fact that perforations of the large bowel should not be sutured primarily, but rather that the segment of bowel should be exteriorized or the fecal stream diverted by proximal colostomy. This principle is in contrast to injuries of the small bowel. Its strict application during the war resulted in the saving of many lives. It is important, however, to note the distinction between exteriorization of a wounded segment of bowel, and colostomy to divert the fecal stream. At times both purposes may be accomplished by one and the same procedure, but a clear understanding of the purpose of the operation is essential to the selection of the techniques involved. For either purpose, the basic technical requirement is adequate mobilization of the segment of the large bowel that is brought to the surface of the abdominal wall. Sufficient mobilization is not always easy in the fixed portions of the colon or in the flexures or rectosigmoid region. But insufficient mobilization, with dependence upon sutures or clamps to maintain the bowel in its abnormal position, frequently results in retraction. This leads to a fecal fistula that may be difficult to repair, or, in the case of an improperly functioning colostomy, defeats the purpose of the operation by allowing fecal matter to enter the distal segment. Early in convalescence, retraction of the bowel may result in life-endangering abdominal wall infections, or intraperitoneal sepsis.

Exteriorization. Exteriorization of the damaged segment through a laterally placed muscle-splitting incision is the established procedure in the management of wounds of the large intestine.[4] The loop of bowel must lie comfortably on the abdominal wall without tension and with proper orientation of its proximal and distal limbs—that is, not twisted on itself. When the limbs are twisted, the application of a spur crushing clamp may endanger the blood supply in the subtending mesentery. When the bowel is properly exteriorized, the mesentery falls naturally into a fold on the medial aspect of the loop, leaving the bowel walls in contact on the lateral side.

In cases in which the injury is larger than one-half of the diameter of the bowel, or a segment has to be resected because of damage done to the mesentery, exteriorization takes the form of a double-barreled spur. Sutures may be placed to approximate the antimesenteric borders of the intraperitoneal portions of the limbs for subsequent crushing by a clamp. Care must be taken not to penetrate the lumen of the intestine or to strangulate the vessels by suture.

Sigmoid Colostomy is required to divert the fecal stream in cases of injury to the pelvic colon below the level at which exteriorization is possible.[5] If the perforation is at a point so low as to make it impossible to exteriorize the bowel, the perforation is repaired by suture and a proximal colostomy is performed. Sigmoid colostomy is, therefore, indicated in wounds of the rectum and in certain perineal and buttocks wounds as an aid to wound healing and secondary suture. Such wounds are frequently contaminated. A tube colostomy or cecostomy does not divert the fecal stream from the remainder of the colon and should therefore not be used. Colostomy in the left half of the transverse colon is a useful procedure in the presence of extensive pelvic injuries that require subsequent repair by the abdominal route. This is particularly true if a suprapubic cystostomy is also indicated, or if there is also extensive damage to the left lower quadrant of the abdomen. Placement of the colostomy in the laparotomy incision or in a defect produced by the missile causing the wound is to be avoided, because all too frequently this results in infected incisions and hernias. Formation of a loop with proper orientation of the bowel provides an adequate sigmoid colostomy. Formal construction of a long spur is not necessary and actually may be undesirable. Extensive damage to the lower bowel segment, associated injury to the bladder and urethra, wounds that extensively compound the bony pelvis, and injuries to the rectum, are examples of injuries that require a prolonged and completely functioning artificial anus. Here the loop must be made sufficiently long to allow for complete transverse section of the bowel and some separation of the two stomata. As ultimate closure will be by end-to-end suture, formation of a spur is not desirable.

Cecostomy. Tangential perforations of the cecum are best managed by exteriorization. Single perforations require mobilization of the bowel in a search for retroperitoneal perforations. Cecostomy, even when necessary because of direct injury to the cecum, should not be employed as a substitute for proximal colostomy when the indications for the latter are present.

Right Colostomy. In extensive injuries necessitating resection of the cecum, the most important principle to observe is complete separation of the ileostomy from the laparotomy incision or from a large abdominal wall defect. The most satisfactory method for dealing with the end ileostomy is a separation of the ileum from the proximal end of the colon by creating a terminal ileostomy in a separate incision in the right lower quadrant and exteriorization of the end of the colon below the costal margin. Every effort should be directed toward the early anastomosis of the ileum to the transverse colon.[2]

Perforation of the Rectum. Wounds of the rectum are characterized by inaccessibility, difficulty of diagnosis, frequent associated damage to other structures, and the hazard of pelvic and ascending retroperitoneal cellulitis. Deviations from the principles established for the management of wounds of the rectum lead to serious complications. Colostomy (not cecostomy) is mandatory. Colostomy should completely divert the fecal stream, and usually should be located in the sigmoid colon. Free posterior drainage must be obtained. This is best established by incision of the fascia propria, thus exposing the rectal, sacral, and paramedian spaces. Attempts to drain the retroperitoneal space through a wound of the buttocks have usually met with disaster. In establishing posterior drainage, it may be desirable to increase the exposure by removal of the coccyx. This is done as a disarticulation of the coccyx by sharp dissection and erasure of the exposed articulating cartilage, and not by incomplete amputations with bone forceps.[5]

Postoperative Care. Complete and adequate postoperative care of the critically wounded patients is vital.[6] Briefly, (1) nasogastric suction, (2) the administration of whole blood and plasma, (3) parenteral fluid therapy in quantities large enough to insure a 24-hour output of 1,200 to 1,500 cc., (4) aspiration of tracheobronchial secretions to prevent postoperative atelectasis and pneumonia, and, (5) the use of chemotherapeutic and antibiotic agents. The latter in the form of penicillin and streptomycin, both intraperitoneally and parenterally, are apparently standing the test of time.

Closure of Colostomy. The author has evolved certain principles to follow in the closure of colostomies:

(1) An inadequately functioning colostomy deteriorates into a useless fecal fistula when it no longer diverts the fecal stream. It should be either closed or reestablished as an effective artificial anus, depending upon the conditions of the bowel below it.

(2) Whenever feasible, spur crushing clamps should be applied. Care in this procedure must be exercised to make sure that the mesentery is not between the two limbs of the bowel, and that the limbs are not rotated.

(3) Extraperitoneal closure of colostomy has proved to be best, in the author's experience. (In only a few instances was it necessary to carry out a formidable intraperitoneal end-to-end suture.) The bowel is freed down to the peritoneum and, after closure, is placed in the extraperitoneal space. Closure of the abdominal wall over the bowel is effected with cotton sutures. Postoperative x-ray studies of the colon with barium enemas have given no evidence of obstruction. In those instances in which after closure of the colostomy the lumen appears to be inadequate, it is supplemented with small side-to-side anastomosis between the proximal and distal limbs.

4. The author has not hesitated to repair large incisional hernias at the same time that the colostomy was closed. Cotton sutures or fascial transplants are employed. Keene[3] is of the opinion that the primary intraperitoneal end-to-end closure of the colostomy affords the best postoperative results.[3] The author has not found it necessary to employ the more formidable procedure.

Although sulfasuxidine or sulfathalidine is used preoperatively, sulfanilamide crystals locally in the wound were found to be completely ineffective and were discarded early. Penicillin and streptomycin are effective and are used intraperitoneally and parenterally.

117 North Claudina Street.

REFERENCES

1. Bowen, L. H.: Mistakes in war surgery, U. S. Naval M. Bull., 44:777-785, April 1945.

2. Colcock, B. P.: Traumatic perforations of the colon as seen in a general hospital, Surgery, 17:1-10, Jan. 1945.

3. Keene, C. H.: Reconstruction of wounds of the colon, Surg., Gynec. and Obst., 79:544-551, Nov. 1944.

4. Laufman, H.: Initial surgical treatment of penetrating wounds of the rectum, Surg. Gynec. and Obst. 82:219-228, Feb. 1946.

5. Ogilvie, W. H.: Abdominal wounds in the western desert, Surg. Gynec. and Obst., 78:225-238, March 1944.

6. Sperling, L., Bosher, L. H., and Zimmerman, H.: Surgery of war wounds of the abdomen, Surgery, 21:258-269, Feb. 1947.

7. Turell, R.: Colonic and proctoscopic diseases—collective review, Part II, Intern. Abst. of Surg., 83:521-531, Dec. 1946.

* * *

Alcoholism

Studies by a Special Committee of the California Medical Association

I. Introduction—Project of appointed committee to include the preliminary study of alcoholism in the State of California with view to collation of information and data and presentation of recommendations to the physician and to the Council for ways and means of meeting this problem.

II. Aspects of the Problem
  1. History of the use of alcohol
  2. Brief survey of the industry—national and state production, revenue and taxes therefrom
  3. Economic loss and cost of alcoholism
    a. Loss of wages, absenteeism
    b. Cost of alcoholics' care in jails and hospitals
  4. Incidence of the role of alcoholism in
    a. Fatal and non-fatal automobile accidents in the United States, state, counties and cities
    b. Felonies, misdemeanors and asocial behavior
  5. Individual effects
    a. Incidence of drinkers and addicts and development of alcoholic habits during adolescence
    b. Deaths from alcoholism
    c. Medical, physiologic and pathologic effects
    d. Psychological and psychiatric results.

III. Treatment of the Problem and the Addict
  1. Legal control of the industry and sale of the product
  2. Activities of law enforcement agencies
  3. Medical aspects—treatment of the acute alcoholic and chronic drinker
  4. Public health aspects
  5. Organizations active in meeting the problem—religious, Women's Christian Temperance Union, Salvation Army, Alcoholics Anonymous, the Yale Study, local option proponents, lay groups and other social efforts.

IV. Recommendations
  1. Role of the physician in private practice in promoting the program, treating alcoholics and disseminating relevant knowledge
  2. Role of hospitals in provision of beds for acute cases
  3. Local medical services required
    a. Hospital and diagnostic facilities
    b. Rehabilitation services
    c. Follow-up services
    d. Coordination of medical, law enforcement and religious and other services
  4. Educational services
    a. Physicians
    b. Auxiliary medical personnel
    c. Law enforcement personnel
    d. Public
      (1) General
      (2) Adolescent and teen-age group
      (3) Elementary schools
  5. Research activities
  6. Implementation of the organized program
    a. State commission
    b. State hospitals
    c. Local commissions
  7. Financing the program
  8. Conclusions

* * *

To: *The Council of the California Medical Association:*

INTRODUCTION

This committee has been appointed by the President of the California Medical Association to collate information and basic data for consideration and evaluation in meeting the problem of alcoholism in California. The committee considers its object should include: (1) The provision of detailed information to the physician, designed to (a) acquaint him with the nature and extent of, and current practices in handling, the problem; and (b) influence his attitude in the care of alcoholic patients and toward his approach to the problem as a leading citizen of the community. (2) The provision of a statement of services, facilities and programs needed to attack the problem. Such a statement may serve as a guide to the California Medical Association in its official approach to the problem and as a guide to its members in their approach to the problem in their communities. (3) Recommendations for the implementation of the program.

This committee shall not engage in any activities designated to promote or prevent the sale or consumption of alcoholic beverages.

A study of the problem in California with a view to making suggestions to the California Medical Association and its members in meeting the problem and aiding the addict.

Aspects of the Problem

1. *Brief History of Alcohol Use:*

Strecker and Ebaugh state that the history of alcohol is coexistent with the history of the human race. Tablets of great antiquity indicate that the Egyptians and other ancient peoples enjoyed beer. Rome was drunk not only upon its military victories but also upon its wines. The barbarians from the North brewed a delectable beverage from cereals and honey called mead. The Caledonians produced Scotch whiskey. The North American Indian concocted a potent beverage from the gall of elk and buffalo which was exposed to the heat of the sun.

Any human habit which persists through the ages, surviving legislative and other efforts to eradicate it, must be motivated by a powerful driving force. The reason that the use of alcohol by man has persisted through the centuries is that it has the quality of blurring the hard, unpleasant and forbidding outlines of reality, and if taken in sufficient quantities, it has the power to efface reality. It is fantasy in a bottle. It is readily obtainable, produces its effects quickly, and for a long time its devotees escape social stigma. Alcohol is a tremendous economic, social, ethical and medical problem.

No country has, as yet, succeeded in working out a solution for alcoholism, despite many sincere and determined efforts. The Jews, living with all other racial groups, seem to be the only group that is almost free from pathologic alcoholism. Their close-knit family and social ties and their dietary restrictions perhaps partially account for this.

The trend of alcoholism is indicated by state hospital statistics of the past 40 years. Early in this century an active educational program disseminated information through newspapers, magazines and school textbooks, concerning the effects of alcohol on the human body and its functions, with some beneficial results. The incidence of alcoholic psychoses among first admissions to the New York State hospitals was reduced from 6.4 per 100,000 total population in 1910 to 1.2 per 100,000 of population in 1920 (the lowest figure on record for that state), during the application of "local option" which resulted in 40 per cent of the population living in "dry" territory.

National Prohibition was accompanied by a steady increase in the incidence of alcoholic psychoses until in 1932 the figure for New York reached 4.5 per 100,000 of total population. Repeal of the Eighteenth Amendment was followed by a further rise in the incidence of alcoholic psychoses, exceeding the rate of 30 years ago.

The Eighteenth Amendment was proposed December 18, 1917. On January 29, 1919, the United States Secretary of State proclaimed its adoption by 36 states and declared it in effect on January 16, 1920. The total vote in senates of the various states was 1,310 for, 237 against—84.6 per cent dry. In the lower houses of the states the vote was 3,782 for, 1,035 against—78.5 per cent dry. The amendment was adopted by all the states except Connecticut and Rhode Island.

Article Twenty-one (Repeal of the Eighteenth Amendment to the Constitution) was proposed in the Senate January 16, 1933, and in the House of Representatives February 20, 1933. It went into effect December 5, 1933, having been adopted by 38 of the 48 states.

2. *Brief Survey of the Industry:*

The Federal Trade Commission, in 1941, as part of its Industrial Corporation Reports, presented an analysis of financial operations of six of the "more important concerns" in the distilled liquor industry. Their total sales in 1939 were valued at $290,699,253; net income after taxes was $17,083,626; dividends paid totaled $1,126,333 on preferred shares of stock and $6,253,776 on common shares—equivalent to 4.9 per cent of the "equity value" of $150,646,987 of the six corporations. These six producers spent for advertising an amount equivalent to 4.8 per cent of sales, or $13,984,494.

The Federal Trade Commission also reported on 21 of the "more important" corporations manufacturing malt beverages—those having about 44.4 per cent of the total value of all products as given in the 1940 Census of Manufacturers for 1939. Their sales in 1939 amounted to $203,496,279; net income after taxes was $23,732,813; dividends paid were $1,069,821 on preferred shares, $12,011,120 on common, equivalent to 10.4 per cent of the equity value of $125,763,115. Expenditures for advertising totaled $14,157,477, equal to 6.94 per cent of total sales.

The Securities and Exchange Commission reported "data on profits and operations" of certain corporations whose stocks were listed on exchanges in 1940. For distillers, ten corporations were listed, having total sales of $349,965,000 in 1940; their net profits after taxes were $24,617,000, an amount equal to seven per cent of net worth.

The SEC reported in 1940 on five distillery corporations in the United States with assets of over $10,000,000 each on June 30, 1939. These owned the major portion of the total assets of the 15 corporations of this industry that had registered securities. The total value of the sales of these five corporations was $308,000,000 in the year ending in 1939. Their profits, after all charges, were $23,100,000, or 7.5 per cent of sales. They paid dividends of $12,800,000 in the year ending in 1939.

The SEC presented data for 27 breweries with listed stocks for 1940. Their total sales were $78,489,000; the net profits after taxes were $7,503,000, which was equal to 9.6 per cent of sales and 11.8 per cent of net worth.

As to distribution, the most recent figures are for 1939, appearing in the 1940 Census of Distribution. In that Census there were reported 135,594 "drinking places," that is, places primarily so operating, such as bars, beer gardens, cabarets, night clubs, saloons, tap-rooms, taverns. Their total sales were reported as $1,385,032,000 or 3.3 per cent of all retail sales for all purposes reported in the Census. (Meals are also served at an undesignated portion of these "drinking places.") Their total payroll was $159,689,900 for 212,235 employees, and there were enumerated 136,217 "active proprietors of unincorporated businesses."

For retail liquor stores selling packaged goods, there were reported 19,136 outlets, with $586,351,000 in sales, 25,676 employees, and a payroll of $30,782,000. Their total sales were 1.4 per cent of all retail business reported in the nation for that year. Alcoholic beverages were also sold to some extent at establishments listed primarily as "eating places," which numbered 169,792; and at food stores, which totaled 560,549.

The most inclusive report of advertising expenditure was made for 1940 by the Bureau of Advertising of the American Newspaper Publishers' Association. The total spent by national advertisers in 1940 was $420,479,424. Expenditure for advertising alcoholic beverages was $19,533,136, being third on the list and exceeded only by automobile and grocery advertising.

Printers' Ink published an item in 1942 to the effect that the brewing industry alone had spent $170,000,000 for advertising since 1933. The estimated total expenditure for advertising in 1940 by the brewing industry was $21,058,000.

The United States Department of Commerce and Graphics Institute report spending habits in the United States in percentage of national income as follows: 4.90 per cent (8.8 billion) is spent on alcoholic beverages, 3.40 per cent (6 billion) for horse race betting, 1.90 per cent (3.4 billion) for tobacco and cigarettes, 0.85 per cent (1.5 billion) given to religious and social welfare, and 10.5 per cent (18.7 billion) for individual United States income taxes. The common estimate of expense for public education in the United States is given as 3.3 per cent—about two-thirds as much as is spent for alcoholic beverages.

In February, 1944, the Department of Commerce published estimates of the total value of alcoholic beverages purchased by people of the United States from 1934 to 1943. The amount estimated for 1940 was $3,595,000,000. For the 131,669,275 resident population of the United States in 1940 this equals $27 plus per capita. For 1934, $2,300,000,000 was spent, and for 1943, $6,830,000,000. The 1934-43 expenditures were equal to 4 to 5 per cent of total income of all the people. For approximately 44,000,000 users of alcoholic beverages the annual outlay averaged about $81 per person.

According to the 1939 United States survey, the manufacture of alcoholic beverages made use of about 3.2 per cent of the total volume of the corn, barley, rice and rye crops and about 60 per cent of the grapes grown commercially. The five branches of alcoholic beverage manufacture totaled 1,241 establishments with 76,585 employees, with a total payroll of $145,464,387. The total wholesale value of manufactured products was $722,561,399.

ALCOHOLIC BEVERAGE INDUSTRY IN CALIFORNIA

The figures in the following table provide an estimate of the dollar value of wholesale and retail distribution of alcoholic beverages in California for 1947 as provided by Arthur H. Samish and associates:

	Wholesale	Retail	Total
Number of premises	905	40,817	41,722
Number of employees	12,503	58,692	71,195
Excise, federal and state taxes, sales taxes and license fees			$227,541,601
Wages and salaries paid	$37,510,209	$176,075,935	213,586,144
Moneys paid to other industries	23,557,791	104,096,104	127,653,895
Total	$61,068,000	$280,172,039	$568,781,640
Capital investment	88,655,307	306,127,500	394,782,807

The Wine Institute has provided the following estimates of the economics of the wine industries of California:

Estimated investments in vineyards, wineries, real property and improvements	$500,000,000
Estimated employment in vineyards and wineries year around	61,000
Estimated total employment in vineyards and wineries at vintage season peak	111,000
Estimated total annual payroll for grape and wine production (year around and seasonal)	$157,000,000
Estimated state and county taxes collected from industry annually as direct taxes, exclusive of income taxes, sales taxes, etc.	2,000,000
Estimated amount of direct taxes collected annually on California wines by Federal Government	70,000,000
Estimated annual purchases of materials (not including grapes), supplies, equipment, services by California wineries and vineyards	75,000,000

These annual estimated purchases of supplies and services include the following:

Glass containers	$20,000,000
Closures	2,000,000
Labels and other printing and lithography	1,800,000
Winery equipment	5,000,000
Winery construction	5,000,000
Transportation	10,000,000
Advertising	10,000,000
Vineyard supplies	5,000,000

Arthur H. Samish and associates have provided the following additional estimates of distilleries and breweries, and of wineries, storerooms, etc., in California:

"There are only four small distilleries in the State of California which do little business and employ about 55 people.

"There are nineteen breweries in California. They employ around 5,000 and have a value in capital of around $100,000,000. California is eighth among state productions of beer, last year paying tax of $8.00 a barrel to the Federal Government and 62 cents a barrel to the state on 4,500,000 barrels of beer. In producing this amount of beer the breweries used $25,031,000 worth of agricultural products. The breweries spend several million dollars annually in advertising. In addition they maintain huge fleets of trucks, are heavy users of transportation facilities, and market their supplies through about 40,000 retail outlets such as grocers, bars, hotels, restaurants and package liquor stores.

"There are 418 bonded wineries and storerooms, and estimated capital invested in vineyards, wineries and real property with improvements, equipment and inventories is $500,000,000; land planted to vineyards, 557,000 acres; annual grape production, 2,895,000 tons; annual farm value of grapes, $183,484,000; annual winery grape crush, 1,308,941 tons; annual gross wine production, 140,824,500 gallons; annual value of wine production, $144,469,000; winery storage capacity, 285,500,000 gallons; annual wine inventories, 184,996,000 gallons; annual winery value of wine inventories, $165,913,000; year-round employment in vineyards and wineries 60,000 persons; annual payroll of employees in vineyards and wineries, $125,000,000; annual taxes, $75,000,000."

It will be noted that these latter figures are closely in agreement with those provided by the Wine Institute.

These estimates indicate that the total capital investment in all phases of the alcoholic beverage industry in California probably exceeds a billion dollars. The total annual payroll approaches a half billion dollars, and taxes are well in excess of a quarter billion dollars. The industry is important in California.

3. *Economic Loss and Cost of Alcoholism:*

(a) Loss of wages, absenteeism: In 1940 loss of earnings by those who drink to excess in the United States was $1,500,000,000, or equal to $30 per person per year.

It is estimated that 70,000 men pass in and out of county and local jails in the United States each day. It is proper to assume a potential wage loss of $1,116 for each of these 70,000; that is, $78,120,000. The National Safety Council assigned $1,800,000 as the potential wage loss of persons involved in accidents due to inebriety; 6.6 per cent wage loss in this group equals $118,800,000. Inebriety was an important contributory factor leading to imprisonment in 19.6 per cent or 32,340 of the total of 165,000 Federal and state prisoners. Of prisoners released in 1940, 5 per cent were females. It may be estimated that 1,617 females had an average wage loss of $656 or $1,600,000, and 30,723 males an average wage loss of $1,116 or $34,288,000, a total of $35,348,000.

A study of absenteeism in three Connecticut cities in 1942 revealed that in one factory of 18,000 employees, 2.7 per cent lost time on one or more occasions because of acute alcoholic intoxication. In another establishment of 20,000 employees, 4 per cent lost time for this cause. At Yale Plan clinics it was found that inebriate factory workers lost an average of three work days per month or 36 days per year. The average of several surveys of 2,400,000 inebriates in 1940 indicated 624,000 were industrial workers. Applying the 36-day-per-year loss to the median annual earnings of $1,116, wage loss from alcoholism in 1940 can be estimated at $69,632,000. The total potential wage loss of the groups considered was $442,960,000.

According to the Yale Clinic Studies, expenditures due to inebriety in 1940 throughout the United States were $347,017,000 and potential wage loss $431,886,000, giving a grand total of $778,903,000.

(b) Cost of alcoholics' care in jails and hospitals: Of individuals hospitalized in the United States with mental illnesses of all types, 86 per cent were in state hospitals in 1940. Of those with alcoholic psychoses, however, only 72 per cent were cared for in state hospitals, 19 per cent in private hospitals, and the remaining 9 per cent in veterans', city and county hospitals.

Inebriate patients with psychosis in New York mental hospitals in 1940 numbered 4,845; without psychosis, 7,142. The estimated daily number of alcoholic patients in mental hospitals in the United States in 1940 with psychosis was 13,400, and without psychosis was 2,900. The per patient average cost in 1940 was $261.50 in state hospitals, in veterans', city and county hospitals $30 higher; and in private hospitals it was $30 to $100 per week, averaging $50 weekly or $2,600 yearly. The total cost in mental hospitals was $13,000,000 for an average daily number of 16,300 patients.

Statistics indicate inebriety to be a contributory factor in 18 per cent of all charity cases.

A report by R. S. Binay (Quarterly Study of Alcohol, 3:686-716, 1942), states that of 1,576 first admissions to Sing Sing in 1938-9, and of 1,539 in 1939-40, alcoholism was closely related to the commission of the crime in 22 per cent of the prisoners.

4. *Incidence of the Role of Alcoholism in:*

(a) Fatal and non-fatal automobile accidents in the United States, state, county and cities: No quantitative estimate of the role of alcohol in traffic accidents has been made, but guesses on the contribution of inebriety vary from 5 to 75 per cent. For 1940 the National Safety Council reported that the driver or pedestrian had been drinking in 20 per cent of fatal accidents.

Fifty-seven cities with over 10,000 population use alcohol tests in traffic accidents. A number of local surveys in 1937-8 showed 13 to 31 per cent of drivers involved in accidents had sufficiently high blood alcoholic concentrations to indicate that they were intoxicated. In 1940 the National Safety Council reported 850,000 non-fatal motor accidents with 1,200,000 injuries and 5,200,000 motor accidents with property damage. The Council reports "five to ten per cent" of all traffic accidents were due to alcohol.

The National Security Council estimated the cost of *all* accidents in the United States for the year 1940 as follows:

	National Council Estimate (millions of dollars)	Estimate adjusted for Age (millions of dollars)
Medical expense	300	257
Overhead cost of insurance	300	294
Property damage (motor vehicles)	800	800
Wage loss	1,800	1,800
Total	3,200	3,151

The Annual Statistical Report for 1948 of the Department of California Highway Patrol, which does not include accident reports of cities, lists "had been drinking" (HBD) drivers and pedestrians involved in California fatal and injury motor vehicle accidents from 1936 to 1947 inclusive, as shown in Table A.

Arrests by the Department of California Highway Patrol for driving while intoxicated:

Year	Arrests	Year	Arrests
1936	4,974	1942	7,972
1937	5,413	1943	4,765
1938	6,718	1944	4,027
1939	6,058	1945	4,642
1940	7,346	1946	6,484
1941	8,870	1947	7,181

The rural accidents in the State of California involving drivers who had been drinking in 1947 totaled 4,772, of which 384 resulted in fatal and 4,388 in non-fatal injuries.

The District Attorney's office of Los Angeles County estimates there are 10,000 arrests per month of alcoholics and vagrants (who are usually released in a few hours) at a cost of $20 for each arrest. This cost of two and a half million dollars per year can be attributed directly to chronic alcoholism.

Jail bookings and sheriff's arrests in Los Angeles County for "Drunk, Drunk Driving, and Liquor Law Violations" as well as the total bookings and arrests for the fiscal years 1937-38 to 1947-48 are shown in Tables B and C.

The pronounced increase in jail bookings since 1944-45 is not due entirely to an increased number of persons being taken into custody. It is particularly due to a change in policy whereby the Los Angeles Police Department now books more of its prisoners in the county jail.

TABLE B.—*Los Angeles County Jail Bookings*

Year	Total Bookings	Drunk	Drunk Driving	Liquor Laws
1937-38	21,816	5,100	1,816	135
1938-39	21,153	4,807	2,055	137
1939-40	22,046	4,908	1,667	131
1940-41	23,261	5,303	2,113	70
1941-42	23,788	5,187	2,071	87
1942-43	19,993	4,283	1,433	68
1943-44	20,250	3,444	1,042	38
1944-45	21,537	4,379	1,114	34
1945-46	26,266	5,570	1,339	33
1946-47	36,393	8,175	2,016	106
1947-48	39,795	9,114	2,201	81

TABLE C.—*Arrests by Los Angeles County Sheriff's Office*

Year	Total Arrests	Drunk	Drunk Driving	Liquor Laws
1937-38	18,782	5,253	1,108	32
1938-39	18,426	4,835	1,167	45
1939-40	19,062	5,183	1,063	58
1940-41	21,201	5,405	1,109	17
1941-42	19,736	5,123	1,160	44
1942-43	18,529	4,725	1,056	71
1943-44	19,273	4,884	850	28
1944-45	20,431	4,861	869	18
1945-46	22,238	5,886	1,141	25
1946-47	28,878	7,901	1,501	114
1947-48	26,214	7,843	711	130

The Los Angeles City Police Department Annual Report for 1947 reveals:

1. Motor vehicle traffic injury accidents:

Condition of driver:	
Had been drinking	2,756
Physical defect	232
Asleep, fatigued, etc.	173
Other handicaps	140
Total	3,301

2. Total traffic violations numbered 10,610. Of this number 612 were under the influence of alcohol.
3. Accidents involving pedestrians:

Condition of pedestrian:	
Under influence of alcohol	116
Other had been drinking	381
Total drinking, and effects	638

4. Causes of street traffic accidents:

Drunk driving—felony	1
Drunk driving—misdemeanor	1,074
Total all causes	11,926

(Report continued on next page)

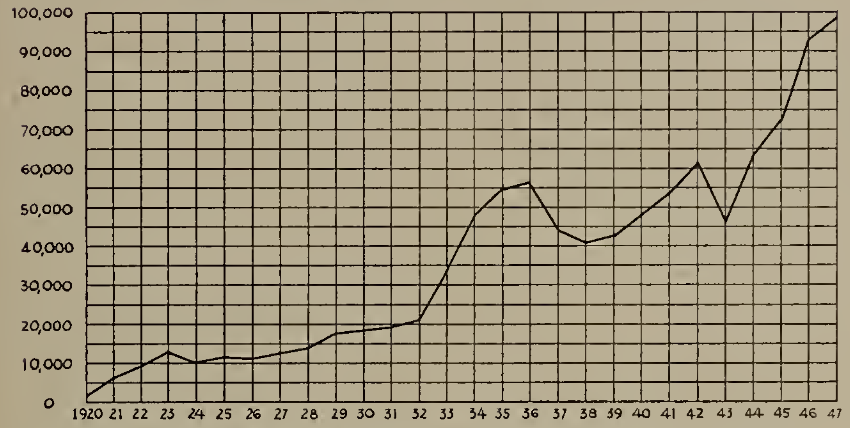
TABLE A.—*Showing Increasing Number of Accidents Involving Drivers Who Had Been Drinking*

	HBD Drivers			HBD Pedestrians			
Year	Total Accidents	Fatal Accidents	Injury Accidents	Total Accidents	Fatal Accidents	Injury Accidents	Total HBD Persons Involved in Accidents
1936	4,182	406	3,776	1,169	211	958	5,351
1937	4,438	422	4,016	1,246	217	1,029	5,684
1938	4,483	371	4,312	1,202	165	1,037	5,885
1939	5,070	403	4,667	1,218	191	1,027	6,288
1940	5,516	383	5,133	1,339	196	1,143	6,855
1941	6,789	447	6,342	1,679	235	1,444	8,468
1942	7,218	434	6,784	1,707	167	1,540	8,925
1943	6,551	423	6,128	2,101	239	1,862	8,652
1944	6,900	412	6,488	1,908	193	1,715	8,808
1945	9,082	601	9,481	2,349	249	2,100	11,431
1946	10,424	668	9,756	1,986	202	1,784	12,410
1947	10,612	607	10,005	1,719	173	1,546	12,331

5. Fatal motor vehicle accidents:

Condition of pedestrian:	
Under influence of alcohol	4
Other had been drinking	28
Total	223
Driver had been drinking	69

6. Arrests for intoxication:
By calendar year Jan. 1920 to Dec. 1947:



7. Arrests bookings (traffic)—drunk driving, 17 of 61.
8. Arrest bookings (Municipal Code)—drunk, 6,823 of 7,732.
9. Arrests for drunkenness, 97,483 of 142,938 (all arrests).
10. Arrests for driving while intoxicated, 2,611 of 142,938 total arrests.

(b) Felonies, misdemeanors and asocial behavior: A Federal Bureau of Investigation study in 1940 of 1,212 cities with a population of 41,146,894, indicated that of all those arrested, 11.81 per cent were held for drunkenness, 3 per cent for disorderly conduct, 1.68 per cent for vagrancy and 0.76 per cent for driving while intoxicated.

In 1940, in 79 cities with a population of 13,493,387, 155,528 were found guilty of drunkenness, disorderly conduct and vagrancy, and 7,267 of driving while intoxicated. The investigators estimate that persons arrested for drunkenness cost 70 per cent of the amount spent for 3,000 county and local jails, which is equal to $25,550,000.

5. *Individual Effects:*

(a) Incidence of drinkers and addicts and development of alcoholic habits during adolescence: In 1940 about 2,400,000 excessive drinkers were reported in the United States, of whom 600,000 were chronic alcoholics. It is estimated that expenditures for disease were about 33 1/3 per cent higher in the alcoholic than the average of $23, or $30.70 per alcoholic. Thus, for 2,400,000 persons the increased cost due to alcoholism is $18,480,000.

There are 100,000,000 people in the United States of drinking age (over 15); of these 50,000,000 use alcoholic beverage. Of these, 3,000,000 become excessive drinkers and of this number 750,000 become chronic alcoholics. In other words, of 1,000 users, 60 become excessive and compulsive drinkers without chronic alcoholism and of these, 15 become chronic alcoholics with or without compulsive drinking. Hence inebriety is found in 6 per cent of the users (50,000,000) or 3,000,000. Of these, 2,600,000 are men, of whom 2,100,000 are between 30 and 60 years of age. The American Youth Commission Study of 1938 reported on 13,528 individuals between the ages of 16 and 24, of whom 52.9 per cent drank alcoholic beverages, 9.3 per cent were generally opposed to drinking liquor, and 27.8 per cent did not use liquor, but were not opposed to others' using it. In 1938 the Northwestern Life Insurance Company reported 40 per cent of men and 8 per cent of women among applicants under 30 admitted that they used alcoholic beverages.

(b) Deaths from alcoholism: In 1940 the Bureau of the Census reported 2,531 deaths as due to alcoholism; and alcoholism was given as the primary cause in 3,109 deaths. Of those whose death was due to alcoholism, 13.6 per cent were involved in fatal accidents. It is probable that at least 50 per cent of deaths from alcoholism are unreported as such, due to reluctance of physicians to certify alcohol as the cause of death. Moreover, in many cases cirrhosis of the liver and other fatal conditions largely attributed to alcoholism are not designated as due to alcoholism. Jellinek concluded in 1940 there were 15,250 deaths from alcohol and cirrhosis and that the fatal accidents in the chronic alcoholic population were estimated to be 2,074. The total inebriate population is four times the chronic alcoholic population. The fatal accidents among all inebriates numbered 8,296 in 1940, and 698,130 alcoholics were involved in non-fatal accidents. This made a total of 706,426 fatal and non-fatal accidents in the entire inebriate group, which is equal to 9 per cent of the total of 7,843,049 fatal and non-fatal accidents in the general population 15 years of age and over.

(c) Medical, physiologic and pathologic effects: Certain bodily diseases are more frequent in excessive drinkers, for example, vitamin deficiency and cirrhosis of the liver. Chronic alcoholics are more susceptible to polyneuropathy and pneumonia and are less liable to survive pneumonia. Twenty per cent of chronic alcoholics in hospitals complain of burning sensations in the feet and of pains in the legs—symptoms similar to those seen in dry beri beri. Pellagra is obvious in more than 10 per cent. A British insurance company study showed abstainers had a greater life expectance at every age level; the greatest difference, 3.9 years, was shown at the age of 25. After that it declined until at age 60, there was a difference of one year. About 10 per cent of alcoholics develop diseases of the mind from long heavy drinking. There are probably 5,000 to 6,000 instances of delirium tremens every year in the United States. Disorders of chronic alcoholism are essentially nutritional disturbances. Of all persons discharged from New York general hospitals in 1933, 2.7 per cent had received treatment for alcoholism.

The effect of alcohol on the body, apart from its action on the brain, can be divided into acute and chronic phases. The principal acute effect is on the stomach. This effect may be asymptomatic if the ingestion is slow. Mild stages of nausea may follow. The individual effect varies; some persons are stimulated to eat, while others lose all taste for food. It is in this latter group that nausea and vomiting usually develop. While a certain amount of the nausea and vomiting that occur is due to the central effect, another factor is the irritation of the gastric mucosa. At times this irritation may be great enough to cause slight or even massive bleeding from the stomach. Diarrhea may follow. It is well known that many people with peptic ulcers have their first hemorrhage after the use of alcohol. We may summarize by saying that the acute effects of alcohol are disabling but are not often serious.

The chronic users of alcohol may develop some form of cirrhosis of the liver, various vitamin deficiencies, and increased liability to infection. There is a great deal of work to show that these chronic effects of alcohol are not due to the alcohol itself but are attendant upon the vitamin deficiency that ensues. This occurs through two mechanisms. First, those who drink a great deal usually are poor eaters, heavy smokers, and light sleepers. This means that their vitamin intake is reduced, and coupled with this they rarely eat fresh fruits or vegetables. In addition, alcohol requires considerable amounts of thiamine, riboflavin, and nicotinic acid in the process of being utilized by the body as a source of energy. The resulting vitamin deficiency makes itself known by the presence of sore tongue, cracking around the corners of the mouth, and dry, flaky skin. In the later stages there is a numbness and tingling of the feet and hands. Persons in advanced stages may become paralyzed. Long before actual cirrhosis sets in, the individual notices an increased number of colds and perhaps has had pneumonia a time or two. It is well known that alcoholics do not recover from pneumonia as rapidly as others despite the use of larger than average amounts of penicillin and sulfonamides. This lack of resistance to infections may be secondary to loss of immune bodies, which the ailing liver is no longer able to manufacture in adequate amounts to meet the body's need. With the onset of cirrhosis the patient is in a sad plight. The abdomen swells with fluid, while at the same time the extremities become wasted and weak. He gradually loses strength, and usually has to enter a hospital at intervals to have the fluid removed from the abdomen. Occasionally he vomits blood, this time because there are now large vessels in the stomach developing in an effort to get the blood past the diseased liver. He finally sinks into a coma and dies.

(d) Psychologic and psychiatric results: Alcohol is always a narcotic, and its reputation as a stimulant rests on the inhibitory release which it promotes. Parallels are found in symptoms due to disease of the frontal lobes of the brain, in the behavior which follows frontal lobe operations, and in the manic phase of manic-depressive psychosis. In these situations, as in alcoholism, there is loss of inhibition, abolition of self-critique, and in general, regressive behavior. At times, there is shedding of all adult responsibilities, so that the drunkard becomes as an infant with profound loss of control, even involving the functions of the bladder and bowels. The use of alcohol is the most common mechanism of escape from mature responsibilities.

A number of psychoses are influenced by alcohol, but chronic alcoholism is not a psychosis. Strecker and Ebaugh consider that chronic alcoholism is a psychoneurosis. It is preponderantly the psychoneurosis of the introvert—the shy, reserved, diffident individual who tends to be socially awkward and who acquires social facility only with the greatest difficulty. Alcohol is used to escape reality, just as psychoneurotic symptoms are employed unconsciously for the same purpose. Rationalization is common in both psychoneurosis and alcoholism.

The psychoneurotic person cannot meet the requirements of everyday reality because of headache, vertigo, nausea, vomiting, tachycardia, etc., which are derived from emotional conflicts and not produced by structural pathology. The pathologic drinker exhibits extreme rationalization in giving his "reasons" for his excessive drinking. He drinks because he has financial losses, because his health is poor, because his wife nags him, even because of unpleasant weather conditions. These rationalizations, like the symptoms of the psychoneuroses, become screens used unconsciously to prevent an honest facing of real basic issues.

The basis of alcoholism, as of psychoneurosis, is *emotional immaturity,* and as in the psychoneurosis the immaturity is rooted in childhood. Case records show a common situation in alcoholic patients during childhood. Parental dominance (usually "loving" dominance) prevented them from learning to make decisions; emotional growth lagged. When adult years were attained, the individuals were ill equipped for the give-and-take of personal social relationships. They became thwarted and frightened. Soon they discovered temporary confidence and security in alcohol.

Homosexuality probably plays only a small part in the cause of alcoholism; latent heterosexuality is more important. This is part of the emotional immaturity, allowing a "casual flitting about sexually," and constituting an evasion of the mature responsibilities of sex, home building and children.

Those who cannot face reality without alcohol; who take morning drinks and who drink alone; those who cannot control their excessive drinking, are chronic alcoholics. They cannot make adequate adjustment to reality as long as they use alcohol.

The following classification of alcoholism from Strecker and Ebaugh's "Clinical Psychiatry" divides the patients into etiologic groups:

1. Social drinking.
2. Reactive alcoholism: In those who drink in relation to or as an escape from some vocational, marital, economic or physical difficulties.
3. Symptomatic alcoholism: In which alcoholism exists as one manifestation of the behavior difficulties encountered by patients suffering from one of the psychoses.
4. Alcoholism in a psychoneurosis: Where the psychoneurosis seems to be the etiologic factor.

5. Alcoholism simplex or essential alcoholism: The group where no factors are found which can be reasonably labeled etiologic. Many patients classified as "psychopathic personalities" are included in this group.

This practical classification is further elaborated as follows:

1. *Social Drinking:* Under this heading may be included that wide and much discussed group ordinarily called "normal" or "social" drinkers. It may be presumed to include that group whose drinking varies from an annual Christmas eggnog to the daily before-dinner cocktail, and perhaps may include an occasional vacation spree. To be included in this group the person must in no way be dependent upon the toxic effect of alcohol. Many persons who consider themselves social drinkers probably border upon the situational group. In all instances they are able to indulge in or forego the pleasure of the alcohol, depending upon the proprieties of the occasion.

2. *Reactive Alcoholism:* Within this group fall that heterogeneous assortment of individuals who drink in relation to or as an escape from some environmental situation. Persons drinking in relation to vocational, marital, economic and physical difficulties not related to deep-seated personality problems may be properly included here. It is believed that a more thorough understanding of the alcoholic patient will result in a gradual absorption of this group into other headings of the classification.

3. *Symptomatic Alcoholism:* This is the phase of the problem in which the alcoholism exists as one manifestation of the behavior difficulties encountered by patients suffering from one of the major organic or functional psychoses. The alcoholism may temporarily color the general reaction, but careful study reveals the true situation and suggests the proper treatment.

4. *Alcoholism in Psychoneurosis:* In certain alcoholic patients psychoneurosis seems to be the etiologic factor. Certain of these persons use alcohol for a relief of the tensions and anxieties accompanying the disorder; and in other persons the alcoholism itself is the prominent manifestation of the neurotic mechanism. The analytic literature contains numerous examples of the latter kind of patients.

5. *Alcoholism Simplex or Essential Alcoholism:* Into this category are placed those patients in whom there can be found no factors which can reasonably be labeled etiologic. Such persons present a problem which is neither essential nor simple and the terms are used to mask our ignorance as to the true psychopathology of this state. Many persons who drink excessively and who may be classified as having "psychopathic personalities" are included in this category.

Alcoholic psychoses are commonly classified as: (a) Pathologic intoxication; (b) Delirium tremens; (c) Korsakoff's psychosis; (d) Acute hallucinosis; (e) Chronic hallucinosis; (f) Acute paranoid type; (g) Alcoholic deterioration.

Rosanoff delineates Miles' scale of toxic symptoms from alcohol as follows:

Alcohol in the Blood (Percentages)	Subjective States and Observable Changes in Behavior Under Conditions of Heavy Social Drinking
0.01	Clearing of the head. Freer breathing through nasal passages. Mild tingling of the mucous membrane of the mouth and throat.
0.02	Slight fullness and mild throbbing at back of head. Touch of dizziness. Sense of warmth and general physical well-being. Small bodily aches and fatigue relieved. Not fretful about the weather nor worried concerning personal appearance. Quite willing to talk with associates. Feeling tone of pleasantness.
0.03	Mild euphoria: "Everything is all right," "Very glad I came," "We will always be friends," "Sure, I will loan you some money," "It isn't time to go home yet." No sense of worry. Feelings of playing a very superior game. Time passes quickly.
0.04	Lots of energy for the things he wants to do. Talks much and rather loudly. Hands tremble slightly, reaching and other movements a bit clumsy; laughs loudly at minor jokes; unembarrassed by mishaps, "You don't think I'm drunk do you, why I haven't taken anything yet." Makes glib or flippant remarks. Memories appear rich and vivid.
0.05	Sitting on top of the world, "a free human being," normal inhibitions practically cut off, takes personal and social liberties of all sorts as impulse prompts. Is long-winded and enlarges on his past exploits. "Can lick anybody in the county," but has observable difficulty in lighting a match. Marked blunting of self-criticism.
0.07	Feeling of remoteness. Odd sensations on rubbing the hands together, or on touching the face. Rapid strong pulse and breathing. Amused at his own clumsiness or rather at what he takes to be the perversity of things about him. Asks others to do things for him. Upsets chair on rising.
0.1	Staggers very perceptibly. Talks to himself. Has difficulty in finding and putting on his overcoat. Fumbles long with the keys in unlocking and starting his car. Feels drowsy, sings loudly, complains that others don't keep on their side of the road.
0.2	Needs help to walk or to undress. Easily angered. Shouts, groans, and weeps by turns. Is nauseated and has poor control of urination. Cannot recall with whom he spent the evening.
0.3	In a stuporous condition, very heavy breathing, sleeping and vomiting by turns. No comprehension of language. Strikes wildly at the person who tries to aid him.
0.4	Deep anesthesia, which may be fatal.

Postmortem findings vary according to the stage of the disease at death, the severity and duration of the alcoholism, and the existence of complications, such as avitaminosis and circulatory disease.

The changes found in the central nervous system include pachymeningitis, hemorrhagica interna, cerebral atrophy, polioencephalitis hemorrhagica superior of Wernicke. Acute cerebral edema is found in those dying in an acute delirious state. Shrunken convolutions, moderate dilatation of the ventricles, and thickening and opacity of the pia-arachnoid may be noted.

Because of the popularity of social drinking alcoholism has never been defined exactly. A person may be considered to be alcoholic when he becomes dependent upon the toxic effects of the drug to carry out his work or to meet his social obligations. Alcoholism of itself is responsible for approximately 10 per cent of all mental disease and occurs as a symptom in many of the major psychotic reactions and in some of the psychoneurotic states. Even in moderate doses alcohol lessens motor activity, diminishes physical strength, lowers the fatigue point, interferes with clarity of ideation, impairs

MEDICAL LIBRARY - UNIV. OF MD.

capacity for judgment and mental work, and interferes with the sharpness of memory. Many individuals become quite unstable emotionally under the influence of alcohol. It acts as a direct poison to the cortical cells.

Treatment of the Problem and the Addict

1. *Legal Control of the Industry and Sale of the Product:*

All states and territories have constitutional provisions for the control of manufacture, sale and taxation of alcoholic beverages.

Traffic in alcoholic beverages in California is governed by the provisions of Section 22 of Article XX of the State Constitution, effective December 20, 1934; the Alcoholic Beverage Control Act, the Health and Safety Code, the Penal Code, and the Statutes of the United States.

The State Board of Equalization is charged with administration of the Alcoholic Beverage Control Act and issues licenses. Local officials and the board are charged with the duty of enforcing the law.

(1) The eighteenth article of amendment to the Constitution of the United States was repealed by United States Constitutional Amendment No. 21. (Eighteenth amendment effective May or June 1919; twenty-first amendment effective December 5, 1933.)

(2) The transportation or importation into any state, territory or possession of the United States for delivery or use therein of intoxicating liquors, in violation of the laws thereof, is prohibited.

The provision of the Alcoholic Beverage Control Act imposing a license fee of $500 for the privilege of importing beer within the state does not violate the federal Constitution.

Shipment through the state: The twenty-first amendment has no application to the transportation of liquor through a state; hence liquor purchased for shipment to Hawaii but temporarily stored in San Francisco warehouses is not subject to local property taxation.

California Constitution, Article XX, *State Control of Liquor Sales:*

The license fee required of bona fide hotels, restaurants, cafes, cafeterias, railroad dining or club cars, passenger ships and other public eating places, and any bona fide clubs, after such clubs have been lawfully operated for not less than a year, for the privilege of keeping, buying, selling or otherwise disposing of intoxicating liquors other than beers and wines, is $250 per year or $62.50 per quarter annum for seasonal business, subject to the power of the State Board of Equalization to change such fees.

Apportionment of fees and taxes: The Legislature provides for apportioning the amounts collected for license fees or occupation taxes between the State and the cities, counties and cities and counties of the state.

TYPES OF LICENSES; FEES

		Per Year
(1)	Beer manufacturer's license	$750.00
(2)	Wine grower's license (to be computed only on the gallonage produced):	
	5,000 gal. or less	20.00
	Over 5,000 gal. to 20,000 gal.	40.00
	Over 20,000 gal. to 100,000 gal.	75.00
	Over 100,000 gal. to 200,000 gal.	100.00
(3)	Distilled spirits manufacturer's license	125.00
(4)	Still license (per still)	10.00
(11)	Beer bottling or packaging license	500.00
(12)	Distilled spirits wholesaler's license	250.00
(13)	Beer and wine wholesaler's license	50.00
(16)	Retail package off-sale general license for the first $10,000 retail sales of distilled spirits per year	110.00
	For each $1,000 or fraction thereof over $10,000 per year	10.00
(23)	On-sale general license	75.00
	Plus an amount in accordance with the following:	
	a. In cities of 40,000 population or over	450.00
	b. In cities of less than 40,000 but more than 20,000 population	300.00
	c. In all other localities	250.00
(25)	Wine rectifier's license	250.00

(For other fees and regulations see California Alcoholic Beverage Control Act 1947, page 20.)

Section 23—Tax on Beer and Wine: (a) On all beer 62 cents for every barrel containing 31 gallons and appropriate rate for any other quantity. (b) On all still wines containing not more than 14 per cent of absolute alcohol by volume, 1 cent per wine gallon and proportionate for other quantity. (c) On all still wines containing more than 14 per cent of absolute alcohol by volume, 2 cents per wine gallon and proportionate for other quantity. (d) On champagne, sparkling wine, 1½ cents on each bottle or other container for each half pint or fraction thereof contained therein. (e) Sparkling hard cider 2 cents per wine gallon and proportionate for other quantity.

Section 24—Tax on Distilled Spirits—of proof strength or less, 80 cents per wine gallon and proportionate for other quantity; distilled spirits in excess of proof strength are taxed double the above rate.

Section 37—Disposition of Funds Collected: All moneys collected as license fees and under the excise tax provisions of this act are deposited in the State Treasury to the credit of the Alcoholic Beverage Control Fund. Moneys are apportioned as follows:

(a) All moneys collected from fees are paid semi-annually to the counties, cities and counties, and cities of this state in the proportion that the amount of the fees collected in the particular county, city and county, or city bears to the total amount so collected throughout the state, and the State Controller, during the months of April and October of the year, draws his warrants upon the fund in favor of the treasurer of each county, city and county, and city for the amount to which each is entitled; (b) Such amount as is necessary for the allowance of the refunds provided for in the act; (c) Any remaining balance is transferred to the general fund on the order of the Controller.

Section 61—Sales to Minors: (a) Every person who sells, furnishes, gives or causes to be sold, furnished or given away any alcoholic beverage to any person under the age of 21 years is guilty of a misdemeanor. (This includes married women under 21.) (b) Any minor who purchases any alcoholic beverages or any minor who consumes any alcoholic beverage in any on-sale premises is guilty of a misdemeanor.

Section 61.2: For the purpose of preventing the violation of Section 61 of the act any licensee or his agent or employee may refuse to sell or serve alcoholic beverages to any person who is unable to produce adequate written evidence that he or she is over the age of 21 years.

Section 62—Sales to Habitual Drunkard: Every person who sells, furnishes, gives or causes to be sold, furnished or given away any alcoholic beverage to any habitual or common drunkard or to any obviously intoxicated person is guilty of a misdemeanor.

From Alcoholic Beverage Control Bulletin, State Department of Equalization, Legal Control Division (four issues of 1948, April, May, June and July):

REVENUE DATA

Alcoholic beverage license fees collected in:

March 1948	$ 165,935.74
April 1948	517,464.53
May 1948	134,291.74
June 1948	1,220,286.31
Total fees 1948 to date	3,939,735.66
Total fees collected 1947	8,417,280.50
Total fees 1943-46	78,148,746.65
Total fees collected	90,505,762.81
Less refunds to date	1,247,534.36
Net revenue to June 30, 1948	89,258,228.45

ALCOHOLIC BEVERAGE LICENSES ISSUED

March 1948	3,499
April	2,039
May	1,564
June	1,505

Total issued to June 30, 1948: 58,080.

ALCOHOLIC BEVERAGE TAX SUMMARY

Distilled spirits excise tax:

February 1947	$ 1,051,757.24
February 1948	904,931.07
March 1947	1,029,560.93
March 1948	1,133,876.77
April 1947	938,402.04
April 1948	1,107,038.17
May 1947	954,263.34
May 1948	959,722.01
Total tax Jan. 1 to May 31, 1948	5,008,136.37
Total tax July 1 to Dec. 31, 1947	143,137,177.18
Total tax to date	148,148,313.55
Less refunds	100,092.17
Net tax July 1, 1935, to May 31, 1948	148,045,221.38

(Tax summary continued at top of adjoining column)

Beer and wine excise tax:

February 1947	$ 219,625.21
February 1948	237,105.14
March 1947	291,744.37
March 1948	296,981.93
April 1947	338,147.95
April 1948	299,698.91
May 1947	251,856.49
May 1948	280,159.96
Total tax Jan. 1 to May 31, 1948	1,388,484.04
Total tax April 4, 1933 to Dec. 31, 1947	35,179,225.16
Total tax to date	36,567,709.20
Less refunds	56,696.79
Net tax April 4, 1933 to May 31, 1948	36,511,012.41
Total alcoholic beverage excise tax to date	$184,556,233.79

BEER AND WINE DISTRIBUTION

Beer sales in gallons:

February 1948	11,466,535.73
March 1948	13,669,330.13
April 1948	13,961,450.66
May 1948	13,261,763.45

Still wine under 14 per cent in gallons:

February 1948	1,476,229.26
March 1948	1,734,232.71
April 1948	1,666,915.88
May 1948	1,663,713.91

Still wine over 14 per cent, sales in gallons:

February 1948	7,031,743.57
March 1948	8,106,635.44
April 1948	7,825,586.96
May 1948	6,218,519.12

Sparkling wine sales in half pints:

February 1948	539,371
March 1948	477,086
April 1948	537,066
May 1948	593,634

The *Alcoholic Beverage Control Bulletin* further details the beer shipments into California by out-of-state breweries (in gallons); the sales by California breweries in gallons; the sales by California beer importers in the southern district; a summary of beer and distilled spirits gallonage shipped from California to other states and countries; distilled spirits excise tax payments of over $1,000; distilled spirits excise payments by administrative districts; wine taxes of over $100 paid by California wine growers; board orders denying, suspending and revoking alcoholic beverage licenses, with the reasons for such; protests sustained; and the legal seizure reported under the provisions of the Alcoholic Beverage Control Act by months.

Allocation to cities and counties of their share of license fees collected from July 1, 1947, to December 31, 1947:

The total amount of net fees distributed was $1,882,454. Examples of allocation of this distribution are as follows:

Berkeley (city)	$ 10,693
Alameda (county)	123,845
Fresno (city)	22,916
Fresno (county)	46,911
Bakersfield (city)	11,938
Long Beach (city)	39,687
Los Angeles (city)	255,995
Los Angeles (county)	584,861

Unincorporated areas of Los Angeles County	63,688
Pasadena (city)	13,721
Santa Monica (city)	15,149
Corona (city)	1,050
Sacramento (city)	45,507
San Francisco (city and county)	308,149
Santa Barbara (city)	10,200

Public Revenues and Their Uses (1911-1947): Federal revenue from alcoholic beverages each year has amounted to over one-third of the total receipts of taxes levied by the national government.

The Tax Institute of the University of Pennsylvania data on the public revenues from alcoholic beverages in 1940 are: Total federal tax receipts in 1940 were $4,860,524,000, of which $624,253,000 came from alcoholic beverages. Added to this is $32,340,000 for customs receipts from alcoholic beverages. The total state tax revenues were $3,267,165,886, of which $243,776,068 came from alcoholic beverages. To this must be added the net profits in the "monopoly states," amounting to $66,057,520. The revenues from alcoholic beverages collected by local governments were estimated by the Tax Institute at $3,500,000 out of total local receipts of $4,745,000,000. Thus, the revenues from alcoholic beverages totaled $969,926,588 of total public revenues of $12,872,689,886 (not including payroll taxes). This is almost 8 per cent of all tax revenue. The Distilled Spirits Institute publishes a somewhat higher figure of $1,140,110,006.

No information is available regarding the use of federal alcohol tax receipts. It is general practice to retain local receipts from licenses for the general purposes of local government. The state revenues ($243,776,068 in license states and net profits of $66,057,520 in monopoly states) are in many instances designated for specific purposes. Thus in Alabama 10 per cent of state beer taxes is allotted to state welfare funds and 10 per cent to the public welfare funds of 67 counties. In Colorado—of state license fees and excise taxes, 5 per cent for administration and 85 per cent of the remainder to the old age pension fund. Florida—of the state license fees and excise taxes, 7 per cent for administration, $3,400,000 of the remainder to old age assistance, the next $400,000 to crippled and disadvantaged children, and the balance to general fund for distribution to public schools. Georgia—all license fees and excise tax go to common schools. Indiana—of retail profit fees, one-third to tuition funds of the school taxing units of the state. Louisiana—portion of spirits and wine license fees must be used exclusively for homestead tax exemptions. Beer license fees and excise taxes apportioned to public schools and conditionally to various charitable institutions. Missouri—proceeds from seizures and confiscations to county treasuries for benefit of schools. Montana—of state monopoly proceeds, 5 per cent to teachers' retirement fund and up to $5,000 to the Temperance Commission Fund. Of state license fees—50 per cent to public school fund and portion of the remainder to public welfare fund. New Mexico—largely all state revenues to social security, aid to dependent children, needy blind, and for emergency school fund. Ohio—most of sales tax on beer to poor relief and workmen's compensation fund. Oklahoma—most of state license fees and excise taxes distributed to county school districts. South Dakota—about one-half of receipts from beer and wine licenses, fees and excise taxes to counties for relief and hospitalization and indigent. Texas—state license fees to the old age assistance fund; of the state excise taxes one-fourth to state school funds, three-fourths to old age assistance. Washington—over one-half of state sales tax receipts to state current school fund. West Virginia—sales tax receipts to school funds. Wisconsin—portion of state excise taxes on spirits and wine to state aid of public schools.

There is a general tendency in the states to use portions of the public revenues from alcoholic beverages for educational and social purposes. We have no information of any state's designating revenue for the treatment of the alcoholic patient. A few states may use these funds for mental illness.

Summary and Conclusions: A probable minimal expenditure of $778,903,000 due to the antisocial behavior of inebriates and of conditions due to inebriety has been calculated for the year of 1940. This total might have been higher if more information had been available. It has also been found that the heavily taxed alcoholic beverage industry produced revenues of $969,926,588 for public treasuries in 1940. In 1943 revenues from this source amounted to $1,423,647,000. None of this money was designated for discovery of ways and means of preventing inebriety or for reducing the costs that result from the behavior of those who drink to excess. In 1945 Massachusetts, Connecticut, New Jersey and Indiana proposed plans to allocate a part of the revenues from alcoholic beverages for the treatment of alcoholics and for research on alcoholism.

The New Jersey State Legislature in 1947 enacted a law placing the treatment of alcoholics under the supervision of the State Department of Health, with provisions for their hospitalization and for research on the problem. The costs were to be borne by the state from allocated funds.

Thus, except for the recent efforts of these states, the total effect of the policies is that the state and the public have a socially irresponsible attitude towards alcoholism.

The Department of Finance, State of California, in reply to our request for information concerning the usage and application of liquor license fees distributed to local governments, answered as follows:

"The state law governing distribution of liquor license fees does not specify the fund in which local governments shall deposit such apportionments or the purposes for which the money may be spent beyond the general requirement that state funds are to be expended for a state purpose.

"Since counties are legally subdivisions of the state, the obligation to spend funds for 'a state purpose' is not restrictive. We are informed that liquor license fees received by counties are deposited in the general funds of the several corporations, and the general restriction requiring expenditure for state purpose presumes that such receipts will be spent for liquor enforcement, police protection, traffic control, lighting, etc. We are told that cities, too, deposit their liquor license fee receipts in their general funds.

"The League of California Cities has been studying the problem of state restrictions over subventions to municipal governments and, no doubt, can give you additional information regarding the allocation and use of liquor license fee receipts."

The Department of Finance also sent our request for information to the League of California Cities, which answered through its legal counsel to the effect that, "Liquor license fees paid to cities under the provisions of Section 37 of the A.B.C. Act must, according to the Attorney General's Opinions NS 505, 505a and 505b, be expended by cities for a 'state purpose.' The courts are reluctant to define 'state purpose' and do so only in each case presented to them rather than by stating a broad definition which could be used to determine whether a given purpose was a state purpose under any circumstances. Generally speaking, education, schools, libraries, matters relating to health and sanitation, flood control, law enforcement, traffic regulation and enforcement of the A.B.C. Act itself are probably 'state purposes.'

"Although it is true to a large extent that the counties spend most of their funds as agents of the state, it is also true that they perform some purely local services in the unincorporated areas of the county. However, in the main, the counties are merely agents of the state, performing state functions. To this extent it is, of course, improper to speak of the state budget as being in part for state expenditures and in part for subventions to local government. It hardly seems proper to call an action a subvention when the agent is merely acting on behalf of the principal."

2. *Attitudes of Judicial Agencies:*

The reported attitude of the Los Angeles courts which handle psychiatric cases is that there is no tendency to order treatment for alcoholics unless they are psychotic. They seem to act on the premise that anyone should have sufficient concern to cooperate in the treatment of his diseases and should not be forced to accept undesired treatment. There appears to be no consistent policy on the part of the courts in cases involving alcoholism, unless psychosis be present. There is need for evaluation of this situation in order that the medical aspects may receive fuller consideration.

3. *Medical Aspects—Treatment of the Acute Alcoholic and Chronic Drinker:*

The medical treatment of the acute alcoholic may require astute judgment. As thorough physical and neurologic examinations as are possible need to be accomplished initially, despite the usual hyperactivity and resistance of the patient. It must be recognized that alcohol is a physiologic depressant, and further unnecessary sedation should be avoided. Frequently the patient is noisy and restless, and it may be obligatory to use some sedation. The less used, the less interference with therapy.

Increasing doses of strychnine sulfate every three hours for 36 to 72 hours have been utilized in the past. Still better treatment, however, approaches the toxic condition from a physiologic viewpoint and uses drugs which tend to counteract the depressant effects of alcohol and replace lost food elements.

The usual practice in the treatment of acute alcoholic patients admitted upon a neurologic service at Los Angeles County General Hospital through the past years has included high dosage of thiamine chloride in 10 per cent glucose and normal saline solution administered intravenously. Another method is the use of 10 cc. of metrazol and 100,000 units of thiamine chloride in 1,000 cc. of 10 per cent glucose in normal saline; 25 units of insulin is meanwhile injected intramuscularly. This amount of metrazol, slowly administered in the intravenous drip injection, has not provoked convulsions. On the contrary, it has appeared to lessen the tendency to convulsions, and, in instances where convulsions had been occurring, they stopped. This same treatment may be repeated in four to six hours if indicated by persisting symptoms. A third injection may be given.

Another treatment widely used consists of the administration of 50 cc. of 50 per cent glucose solution containing 50,000 to 100,000 units of vitamin B, accompanied by intramuscular injection of 25 units of insulin. This method, however, without the stimulating metrazol, allows convulsions to occur and makes hypoglycemia possible. Obviously, further glucose solution must be given when indicated.

Seliger of Baltimore offers a preliminary report on extramural treatment of severe delirium tremens in the August 1948 issue of the *American Journal of Psychiatry*. He suggests that it is necessary to develop an extramural technique for treating patients with acute alcoholism because of the shortage of hospital beds and the high cost of hospitalization.

A method which he has used successfully includes the initial use of 1 to 2 gr. of phenobarbital and 3 gr. of sodium dilantin as an anticonvulsant which follows a short physical and neurologic examination. An intravenous injection of 1,000 to 2,000 cc. of 10 per cent dextrose in normal salt solution is then administered. Thiamine chloride, 100,000 to 200,000 units, and 25 units of insulin are introduced into the tubing. Phenobarbital, 1 to 2 gr., and dilantin, 3 gr., are repeated in one and one-half hours after that. No alcohol is given, and candy and heavily sugared orange juice should be available should mild reactions occur. Seliger concludes that this treatment will clear up uncomplicated cases of delirium tremens in individuals under 55 years of age in about ten hours. In some instances it may be wise to administer another 1,000 cc. of the intravenous glucose with insulin and thiamine on the following day, and for several days the patient should be kept on phenobarbital, 1 gr., and sodium dilantin, 3 gr., thrice daily, together with 50,000 to 100,000 units of thiamine intramuscularly.

Another form of treatment in the rehabilitation of the alcoholic is the so-called conditioned reflex treatment as applied by Voegtlin and Le Mere. This consists in inducing emesis with the injection of emetine hydrochloride which the patient thinks is an injection of a vitamin or some other medication. When the patient begins to show the vasomotor evidences of nausea he is given a large dose of liquor in an appropriate situation, including his choice of common brands of whiskeys, accompanied by other forms of positive suggestion in the conversation. The emesis is usually interpreted by the patient as being induced by the whiskey. This procedure is repeated according to routine and soon the patient experiences nausea upon seeing or smelling alcoholic beverages. The authors indicate success in about three-fourths of their alcoholic patients thus treated. It seems obligatory to give psychotherapy following this aversion type of treatment.

Meanwhile, during treatment of the acute condition, careful examinations are repeated and laboratory tests accomplished. Pulmonary congestion, pneumonitis or frank pneumonia may be present. Liver disease is common in these patients. They may have a full bladder which they are unable to empty, and various types of heart disease may be present. Neurological examination may suggest the presence of subdural hematoma or subarachnoid or intraventricular hemorrhage. Lumbar puncture and examination of the spinal fluid may assist in this determination. Should neurologic symptoms with varying depths of coma persist or recur, subdural hematoma may indeed be present.

The physical examination should meanwhile determine the presence and extent of any bony or soft tissue damage which may have been incidentally incurred during the irresponsible state induced by alcohol. Roentgenologic studies, particularly of the skull, should be accomplished, even upon slight suspicion.

Following control of the more acute symptoms, intensive vitamin therapy will be needed for days. Nutrition should be high in calories and protein content. Sedation is to be avoided, although it is recognized that hyperactivity, restlessness, noisiness and insomnia need to be controlled. During this less acute state, the effects of mild sedation are not as deleterious as in the depressed state of acute alcoholism.

Investigation of the personal history and character structure should be begun as soon as the patient is sufficiently lucid. During this period he is usually morose and acutely cognizant of the serious effects of his recent debauch. He is more receptive and responsive to direct suggestions, directions and assistance in future planning. This psychotherapy should be continued. If private care can be arranged, it is highly desirable to place the patient in a sanitarium where alcoholic abstinence can be enforced. Rarely is this possible in the patient's own home, even when ample nursing care and supervision are available. Meanwhile, every effort is made to assist the patient in readjusting to his problems without the use of alcohol. This is done by directing his interests to productive activities and sublimation of his emotional stresses.

4. *Public Health Aspects:*

The preceding discussion has indicated the general scope of alcoholism as a medical and public health problem. What little is being done currently to apply corrective medical measures is directed at the far end of the process, namely, after alcoholism is well established. From a public health standpoint in this, as in other problems of disease prevention, the point of attack should be at the cause, or at least at the beginning of the process.

As in the control of such chronic infectious diseases as tuberculosis and syphilis, treatment of the person who actually has the disease is imperative. Frequently, however, even arrest of further progress of the disease is not possible. If arrest of the disease is accomplished, as in tabes dorsalis, restoration to normal health may not be possible. The same principle applies in alcoholism as in tuberculosis and syphilis. The key to solution of the problem is prevention.

A carefully planned, broad, and continuous public educational program is of basic importance. It is recognized that education alone will not suffice; cases will develop in spite of such efforts. The educational program, therefore, needs to be supplemented by organized state and community effort to detect cases in incipient stages and to provide individual care. Such a plan follows public health and medical efforts to control tuberculosis and syphilis. The second line of defense becomes the recognition of the case of alcoholism at its inception. It may be anticipated that a significant proportion of alcoholics can be cured if the disease is attacked at its onset. A broad medical and public health community program will be necessary in order to attack the problem effectively along this second line of defense.

Even with these two lines of defense, a proportion of cases of alcoholism will go on to the advanced stage, just as some cases of tuberculosis and syphilis either are missed by the screening process or progress despite the application of all known medical knowledge. For such cases the third line of defense becomes the hospitals for long term permanent care. All these three lines of defense must be supplemented by extensive research into new and better methods of attacking the problem at all points.

In the administration of such a broad public health attack on the problem, almost every agency in the state and community is involved. Medical, educational, religious, social, law enforcement, and judicial agencies all have parts to play. With so many actors on the stage, it will be necessary to devise some plan of organization for direction and coordination.

5. *Organizations Active in Meeting the Problem:*

Preliminary reports of the operations of the Yale Plan clinics, begun early in 1944, indicate that promising results in the treatment of alcoholics can be obtained by the expenditure of about $60 to $100 per person. There is a medical committee, appointed by the state medical society. The aim is to aid the alcoholic to find his way back to useful participation in the community. The extension of these methods of treatments (at about $100 per patient) to 600,000 alcoholics in the United States would cost $60,000,000, which is a relatively small portion of the public revenues received from the industry. Such expenditure for prevention and therapy would seem to be wise in the light of the social cost of about $1,000,000,000 paid annually by the people because of inebriety.

In California the Governor's Crime Commission is studying the problem and preparing to make recommendations at the next meeting of the State Legislature. It is recognized by the officials of this state that it is folly to continue large expenditures for law enforcement without properly directed efforts to control alcoholism.

The California Public Health Department is making studies from both medical and public health aspects.

The National Committee for Education on Alcoholism has a western branch in San Francisco. There is an East Bay Committee on Alcoholism attempting to promote interest in the problem, and a group with similar aims was organized in Los Angeles in the summer of 1948.

The San Francisco Committee for Education on Alcoholism has been active and offers counselling service both to alcoholic applicants and to others involved by their behavior.

A series of lectures and conferences are presented annually in Los Angeles under the auspices of the local mental hygiene group for dissemination of relevant information regarding alcoholism. Numerous lay groups throughout the state attempt the rehabilitation of the addict. These include many church and religious groups, the Salvation Army, the Women's Christian Temperance Union, and local option groups.

Considerable activity has been shown by Alcoholics Anonymous, which was organized in 1936, has had rapid growth and has offered help to thousands of chronic alcoholics. Their monthly publication, "Grapevine," is widely distributed and their frequent meetings in 1,200 localities are well attended by enthusiastic, earnest members. The "Twelve Steps" of their program for recovery are as follows:

1. We admitted we were powerless over alcohol—that our lives have become unmanageable.
2. Came to believe that a Power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God *as we understood Him.*
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked Him to remove our shortcomings.
8. Made a list of all persons we had harmed, and became willing to make amends to them all.
9. Made direct amends to such people wherever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and when we were wrong promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God as we understood Him, praying only for knowledge of His will for us and the power to carry that out.
12. Having had a spiritual experience as the result of these steps, we tried to carry this message to alcoholics, and to practice these principles in all our affairs.

Boiled down, these steps mean, simply: (a) Admission of alcoholism, (b) Personality analysis and catharsis, (c) Adjustment of personal relations, (d) Dependence upon some Higher Power, (e) Working with other alcoholics.

Recommendations

1. It is advised that the practicing physician give more time and attention to alcoholics among the families of his patients and those who may consult him about their problem and its treatment. A chronic alcoholic usually has some medical condition resulting from his habit and commonly some personality problem or disorder for which medical treatment is indicated. Alcoholism is as much of a medical problem as other diseases of personality involvement. The physician needs to accept alcoholics both as a personal and a professional challenge. Advice and information given by a doctor, early in the beginning of the alcoholic habit or during the period of social drinking, may prevent patient's physical, economic and social devastation. Young people need advice about alcoholic beverages, for it is found in many medical histories that the chronic drinker and addict began drinking excessively in early youth.

The false glamor and suggestion of enhanced social standing to be achieved by drinking alcohol needs to be dispelled. The family physician can influence excessive drinking habits among his patients and friends as well as in the community. Parents should be informed of the natural tendency of their children to imitate their own habits and customs, including their alcoholic habits. All should be persuaded to avoid excessive drinking. More influence should be brought to bear against driving an automobile after drinking.

Many of the physician's alcoholic patients may be referred to specialists for some psychiatric help —at least to the extent of a few psychotherapeutic sessions. It is hoped that psychotherapeutic clinics may be developed which will make this approach and treatment more readily and widely available. Meanwhile, the family doctor will be first consulted and must be prepared to treat the individual and his problem.

2. It is strongly recommended that beds in county, municipal and private hospitals be made available for the treatment of acute alcoholics. It is suggested that the influence of medical and public opinion be utilized to implement such an allocation. A minimal bed requirement for such treatments should be two beds per 100 in hospitals of over 500 beds and at least six to eight beds in hospitals with 100 to 500 beds. Here the resident staff will be trained in treating this common disorder. Such a service, properly supervised, should meet with no objections from other patients or hospital personnel.

3. (a) It is recommended that diagnostic and rehabilitation centers be developed in the larger areas of population for brief hospitalization of patients in acute stages of alcoholism. During this period the patients may be screened and directed to agencies for further rehabilitation and supervision. This arrangement would utilize the existing agencies of the community and be directed by a central supervising group which would follow the individual patient, through vocational guidance or training to productive occupation. Meanwhile close liaison by an established group of the various religious, social welfare, hospital, court and police agencies would need to be developed.

(b) It is suggested that convalescent units be established for vocational rehabilitation. A number of attempts to organize facilities have been made by several law enforcement agencies with indifferent success.

(c) It is suggested that individuals apprehended for intoxication, repeated inebriety, vagrancy, etc., be interviewed by a psychiatric social worker, or by a psychiatrist, in order that suggestions may be made to the court or law enforcement agency as to the appropriate procedure. Frequently, even superficial investigation may screen out individuals who are psychotic, inadequate or inclined toward dangerous asocial activities. Further study of such individuals may determine the need for close supervision or treatment, while others may be expected to profit from enforced abstinence from alcohol in a restrictive environment. During this confinement the patient should further be evaluated during the rehabilitation program, which includes vocational training, educational and individual psychiatric supervision.

Such a program would require the advice and direction of a visiting psychiatrist, the assignment of psychiatric social workers and clinical psychologists.

Many of the individuals requiring such aid and supervision are homeless men who will require long-continued direction. Following the period of such a rehabilitation program, the patient should be directed to employment in a vocation for which he may be suited or trained. Alcoholics Anonymous has done much vocational placement work and, if properly subsidized, might be able to expand this function.

Such a plan has been in progress for some time at Castaic, California, under the supervision of the Sheriff's Office of Los Angeles County. A psychiatric social worker has been employed and arrangements for a full time psychologist are under way. Organized vocational training is in operation. This unit, however, has facilities for only 570 men who have been remanded there for numerous types of asocial activities besides alcoholism. The plan suggested for similar units would be restricted to individuals whose problem and whose apprehension were mainly due to their alcohol habit. New units should also be so developed and arranged that they may be properly equipped to accept individuals who have had no legal apprehension or who have committed no recognized misdemeanors. Such an arrangement should invite voluntary applications for treatment and rehabilitation.

Many alcoholics may be expected to benefit by psychotherapy in clinics where individual treatment and group therapy are available.

4. A broad educational program should be developed. This should include such fields of training as the following:

(a) Courses of *postgraduate training* for physicians and psychiatrists should be arranged for those actively engaged in this type of work. Symposiums and lecture courses should be established for the general practitioner of medicine and the Program Committee of the California Medical Association should influence the presentation of papers and discussions on this problem. All available means of disseminating knowledge regarding the alcoholic, his personality and treatment should be directed by the Council of the California Medical Association through editorials and articles in the official medical publications of the profession.

(b) Training programs should be developed for auxiliary personnel such as psychiatric nurses, psychiatric and medical social workers and for attendants in hospitals, rehabilitation farms and convalescent units. Both universities and hospitals should be utilized in such training.

(c) Furthermore, training in the form of evening classes and lectures and in-service instruction should be provided for law enforcement workers and jail attendants. This is desirable in order to develop proper attitudes toward the alcoholics who come under their supervision.

(d) Public education concerning the problem of alcoholism is obviously important. This will require dissemination of relevant information and knowledge through the public newspapers and magazines. More academic discussions could be appropriately presented to lay groups as copies of published articles, by continuing supervised lecture courses and by specific talks to groups. Moving picture films could usefully be prepared and shown to lay groups, depicting the effects of chronic alcoholism on the individual, its great economic and social cost and its importance in accident and crime. There should be proper medical and psychiatric technical supervision of any commercial films in which alcoholism is involved.

The younger generation should be instructed in the devastations of this disease, as the large majority of addicts begin the habit during adolescence. Dissemination of this information should be aimed at the junor high school years. Such instruction can readily be included in physical education, elementary physiology, biology and sociology classes.

Even elementary instruction concerning the effects of alcohol will aid the individual and, taught in school during the early 'teen years, will make a strong impression. Some of this knowledge will be discussed in the homes, with added potential effect. It is not generally recognized, even by physicians, how widespread and costly the use of alcoholic beverages has become. It is the duty of educational authorities to instruct pupils on this common and practical subject.

Dissemination of information to the public will improve the generally disinterested attitude toward excessive alcoholic indulgence. When the victim happens to be a member of the family, excuses and alibis are freely available while, on the other hand, when evidence of alcoholic excesses appears in strangers, no sympathy and little attention is offered. Such an individual is usually considered beyond the pale and entirely ostracized.

5. An active research program should be developed on the various phases of the problem of alcoholism. Such studies should embrace investigations in biochemistry and physiology as well as studies in the sociology and statistics of alcoholism. Clinical research in the fields of the psychiatry of alcoholism and techniques of treatments of the acute and chronic alcoholic are also needed.

6. In order to organize, develop and operate such an all inclusive program, some agency will have to be given administrative responsibility. In view of the developing complexities of state and local government it is the recommendation of your committee that some pattern be sought that will for the most part utilize existing agencies. The following pattern of administration is suggested as a possible approach to the problem:

Establish a new Division of Alcoholism within the State Department of Mental Hygiene, this division to be the central planning and coordinating agency within the state. In order to insure wide representation in the approach to the problem and close integration with other agencies in state government which are involved in this field, it is recommended that an Advisory Council on Alcoholism be appointed by the Governor. Such council should include as ex officio members the directors of the Departments of Mental Hygiene, Correction, Youth Authority, Public Health and Social Welfare, together with at least five additional members from among candidates recommended by agencies involved. These are the California Medical Association, local law enforcement agencies, and hospital associations. Such an administrative plan would follow the general pattern developed within the State Department of Public Health for the administration of the Hospital Planning and Construction Program.

It is recommended that the Department of Mental Hygiene be authorized and funds be provided for the construction and operation of two hospitals attached to the two University of California medical schools, these hospitals to serve as research and clinical centers for the study and care of alcoholic patients. These centers could be operated by the Department of Mental Hygiene in close relationship with the teaching and research activities of the state medical schools.

It is recommended that, aside from these two clinical and research centers, local counties assume the responsibility of the development and operation of programs to care for alcoholics. A coordinating council at the county level comparable in representation to the State Council should be formed. Some local governmental agency should be authorized to be the administrative agency at the local level. It is imperative that the medical, law enforcement, social and judicial elements of the program be completely integrated at the local, as at the state level. In this manner the best knowledge, judgment and experience in all fields will be brought to bear upon the problem.

Adequate funds should be provided the State Division on Alcoholism to assist in the development of such local programs.

7. Financing the costs of the continued study of this problem would best be met by legislative allocation of a percentage of the excise taxes derived from the production and sale of the alcoholic products.

Statistical data have been offered to indicate the financial cost of excessive alcoholic indulgence, its influence upon accidents and the physical and mental effects on the individual. No one desires to see this continue. Even distillery advertisements recommend the use of alcohol in moderation. The fact remains, however, that among the large number of drinkers a predictable percentage inevitably become chronic alcoholics.

The cost of alcoholism, directly and indirectly, is a direct charge to the state and community. The actual amount spent for alcoholic beverages in the United States is more than 50 per cent in excess of that spent for public education. With such a large percentage of the population becoming diseased from the habit, public and administrative recognition must be stimulated. The wasteful expenditure of public funds in the apprehension and custodial care of alcoholic addicts, without a logical or systematic attempt to correct the situation, must be corrected.

The social waste from tuberculosis, venereal diseases, cancer and poliomyelitis has been recognized. More recently programs have been instituted for the study and dissemination of information regarding heart disease, diabetes, epilepsy and multiple sclerosis. But, no consistent organized program has been applied to alcoholism, which seriously affects a large segment of the population.

This problem of alcoholism must be met sooner or later. Four states have passed legislation designating funds for the study of this subject and treatment of the addict. The costs of administration would soon be offset by the savings in court, police and jail expenses.

8. *Conclusions:*

This report is presented as a preliminary consideration of the problem of alcoholism, with a view to appropriate recommendations to the Council of the California Medical Association.

Dissemination of knowledge concerning the subject to the membership of the California Medical Association is stressed. Through the influence of the physician, it is anticipated the public will develop proper attitudes toward alcohol, its use and abuse.

Cullen Ward Irish, M.D., *Chairman*
1930 Wilshire Boulevard, Los Angeles.
J. Martin Askey, M.D.
1930 Wilshire Boulevard, Los Angeles.
Hall G. Holder, M.D.
1667 Fourth Avenue, San Diego.
George H. Houck, M.D.
Stanford University.
Malcolm H. Merrill, M.D.
School of Public Health, University of California, Berkeley.

REFERENCES

Yahraes, H.: Alcoholism Is a Sickness, Public Affairs Pamphlets No. 118, 1946.

Jellinek, E. M.: Recent trends in alcoholism and in alcohol consumption, Quarterly Journal of Studies on Alcohol, Vol. 8; June 1947.

Rules and Regulations, Section 22 of Art. XX, Constitution of California and Alcoholic Beverage Control Act. Chapt. 1, Title 4, California Administrative Code. St. Bd. of Equalization, 1948.

California Alcoholic Beverage Control Act & Related Constitutional Provisions 1947. St. Bd. of Equalization. Calif. State Printing Office.

Alcoholic Beverage Control Bulletin, St. Bd. of Equalization, Liquor Control Division, Vol. 13, No. 4, 5, 6, and 7.

Annual Report of Police Dept., City of L. A., Calif., 1947, Police Printing Bureau.

Alcoholics Anonymous, Chapter 10 (reprint).

A. A. Tradition, Works Publ. Inc., 1947.

McCarthy, R. G.: A public clinic approach to certain aspects of alcoholism, Quarterly Journal of Studies on Alcohol, Vol. 6, 550-514, March 1946.

Jellinek, E. M.: Notes on the first half year's experience at the Yale Plan Clinics, Quarterly Journal of Studies on Alcohol, Vol. V, Sept. 1944.

Jellinek, E. M., Efron, Vera, and Keller, Mark: Abstract archive of the alcohol literature, Quarterly Journal of Studies on Alcohol, Vol. 8, 580-608, March 1948.

Alcohol, Science and Society, Quarterly Journal of Studies on Alcohol, 1945.

Jellinek, E. M.: Alcohol problems dissected, Social Action Mag., 11; March 15, 1945.

Landis, B. Y.: Some economic aspects of alcohol problems, Memoirs of the Section on Alcohol Studies, Yale Univ., No. 4, Quarterly Journal of Studies on Alcohol, 1946.

Jellinek, E. M.: Phases in the drinking history of alcoholics, Memoirs of the Section on Alcohol Studies, Yale Univ., No. 5, Quarterly Journal of Studies on Alcohol, 1946.

Quarterly Journal of Studies on Alcohol, Vol. 9, June 1948.

Texon, M.: Medical aspects of an alcoholic service in a general hospital, New York Medicine, Vol. 55, June 5, 1948.

Duryea, L. C., and Hirah, J.: Problem drinking: A challenge to psychiatry, Mental Hygiene, 32:246-252, April 1948.

Basic Concepts of Alcoholics Anonymous, Alcoholic Foundation, Inc.

Strecker, Ebaugh, Ewalt: Practical Clinical Psychiatry, 6th ed., Blakiston Co., Phila., 1947.

Rosanoff, A. J.: Manual of Psychiatry and Mental Hygiene, 7th ed., John Wiley & Sons, Inc., New York, 1938.

California Highway Patrol: Annual Statistical Report for 1948, Sacramento.

Wood, C.: History of the United States, Pathfinder Pub. Co., Washington, 1936.

Taylor, F. J.: Grapes of Cash, Liberty Magazine, Vol. 25, Oct. 1948.

A. B. C. Manual for N. Y. State Law Enforcement Officials and Local A. B. C. Boards—N. Y. State Liquor Authority, New York, April 1947.

Program, National Alcoholic Beverage Control Association, 11th Meeting, Sept. 1948, L. A.

Seliger, R. V.: Case report: A preliminary report on extramural treatment of severe delirium tremens with recovery in ten hours, American Journal of Psychiatry, Vol. 105, Aug. 1948.

Am. Med. Assoc.: Alcoholics Anonymous, Hygeia, Vol. 26, July 1948.

Boles, R. S.: Alcohol and cirrhosis of the liver, Hygeia, Vol. 26, Aug. 1948.

Voegtlin, W. L.: The conditioned reflex treatment of chronic alcoholism, Hygeia, Vol. 26, Sept. 1948.

Fry, C. C.: Drinking in college, Hygeia, Vol. 26, Oct. 1948.

* * *

CASE REPORTS

- The Symptomatic Treatment of Paralysis Agitans with Benadryl: Report of Two Cases
- Acute Volvulus of the Cecum—A Method of Diagnosis, with Report of a Case
- Niemann-Pick's Disease and Its Relationship to the Lipoidoses

The Symptomatic Treatment of Paralysis Agitans with Benadryl: Report of Two Cases

EDWIN OWYANG, M.D., *San Francisco*

THE purpose of this presentation is to call attention to the value of Benadryl in cases of paralysis agitans and to report the effects of the drug on two cases.

There is no known specific cure for paralysis agitans, or Parkinson's disease, and treatment has consisted of symptomatic relief only. The control of the distressing symptoms in this chronic and progressive disorder of the corpus striatum and extrapyramidal motor system has been difficult and often unsatisfactory. The drugs chiefly used are those in the atropine group, but other drugs that show possible elements of effective response, such as amphetamine sulfate, Benzedrine,® have been tried, with various degrees of success. One of the most recent additions is the anti-allergic drug Benadryl.®

Extensive investigations on the pharmacological effects of Benadryl have shown that the drug elicits an atropine-like response, and therefore its action in Parkinson's disease may be similar to that of other parasympathetic-inhibitory drugs. Among investigators who have described this response are Code[2] and Harris, McGavack and Elias.[3]

Benadryl was first tried empirically on a patient with paralysis agitans in 1946 by Budnitz[1] with gratifying results. In 1947, McGavack, Elias and Boyd,[4] in experimental studies on the use of Benadryl, noticed that three out of four patients with this disease were benefited by the prolonged use of the drug. They believed that the change in tremor and work performance were not entirely accounted for on a psychic basis alone.

In 1948, Budnitz[1] reported the use of Benadryl in ten cases of Parkinson's disease. In all these cases improvement was noted, and although the degree varied from slight to pronounced, each of the ten patients noted good results at one time or another. Moreover, previously tried courses of the atropine group of drugs had not given a similarly satisfactory response. Budnitz believed that the reaction to Benadryl was not a suggestive or psychic one, but a true therapeutic response.

CASE REPORTS

CASE 1: A 64-year-old mail clerk had been "nervous" for over ten years. He had noticed tremor of his hands and head, and, during the previous six years, a tendency to fall easily. He had previously been treated with "drops" (belladonna), but had not noticed significant improvement and had discontinued use of the drops after about a year. The pertinent findings at the first visit in July 1947 were the continuous shaking of the head, typical pill-rolling tremor in the hands and stiffness in all extremities, with difficulty in walking.

A course of Rabellon® (compound of belladonna alkaloids) was started, four tablets daily for five months, without any benefit. The patient was not seen again until eight months later, feeling more nervous and shaky. Scopolamine, 0.6 mg., was given three times daily beginning in July 1948. This medication was maintained for four months, and slight improvement was noted. In November 1948, the patient was put on 25 mg. of Benadryl three times daily, in place of the scopolamine. After one week, he felt significantly less nervous and the shaking was clinically diminished. The dosage was increased to 50 mg. four times daily, and in two weeks the patient no longer complained of nervousness, said he felt less tired in doing his work at the post office, and was able to write letters with a much steadier hand. (Formerly, writing had been a severe ordeal.) There was only a little drowsiness from the Benadryl. The medication was continued and four months later the improvements were being maintained.

CASE 2: The patient, a 56-year-old retired merchant, had Parkinson's disease for nine years. For about two years he had been taking scopolamine, which had apparently controlled the rapid progress of symptoms, but when first observed by the author in October 1947, he was complaining that he had difficulty in locomotion and in the tremor of his hands. An attempt at better control was made by increasing the dosage of the scopolamine from 0.4 to 0.6 mg. three times daily. This was maintained for approximately six months, but no significant change was noted. Another increase, to 0.6 mg. four times daily, was then tried, and the general rigidity seemed to be lessened.

In August 1948, Benadryl, 200 mg. daily, was begun and the scopolamine was continued. In a few days, the patient said he felt greater improvement than ever before, and when he was observed after two weeks, definitely greater ease in walking and a lessening of the tremor in the hands were noted. There was no complaint of drowsiness. In October 1948 the scopolamine was withdrawn and only Benadryl was given. During five months of observation thereafter, discontinuance of the scopolamine made no noticeable difference.

COMMENTS

Experience in the two cases here reported seems to add to evidence already reported, by Budnitz and others, that Benadryl gives significant benefit to patients with Parkinson's disease. Admittedly, the action of the drug is not too well understood, and its use may be empirical. However, the atropine-like effect may explain why satisfactory results occur. Moreeover, there seems to be a synergistic action between Benadryl and the parasympathetic-inhibitory drugs, as seen in several of the cases reported by Budnitz, in which the patients did well on the use of Benadryl and one of the other drugs simultaneously. This observation in itself may be of importance with regard to those patients who do not respond to the administration of only one drug.

Whether other similar anti-allergic drugs would give the same action in such patients is not yet know. However, in one of the cases reported by Budnitz, Pyribenzamine was substituted for Benadryl and the improvement gained was lost. Benadryl was then resumed, with a return of relief in three days.

SUMMARY

Two cases in which patients with paralysis agitans were maintained on Benadryl are reported. Partial relief of symptoms referable to the disease was noted in both patients.

Benadryl seems to be of benefit in cases of paralysis agitans, either as a therapeutic agent in itself or as a synergist with another drug of the parasympathetic-inhibitory group, or both. No significant untoward reactions have been demonstrated.

1103 Stockton Street.

REFERENCES

1. Budnitz, J.: The use of Benadryl in Parkinson's disease, New Eng. J. of Med., 238:874, June 17, 1948.

2. Code, C. F.: Discussion of Benadryl as antihistamine substance, Proc. Staff Meet., Mayo Clin., 20:439, Nov. 14, 1945.

3. Harris, R., McGavack, T. H., and Elias, H.: Nature of action of dimethylaminoethyl benzedryl ether hydrochloride (Benadryl): Effects upon the human eye, J. Lab. & Clin. Med., 31:1148, October 1946.

4. McGavack, T. H., Elias, H., and Boyd, L. J.: Some pharmacological and clinical experiences with dimethylaminoethyl benzedryl ether hydrochloride (Benadryl), Am. J. M. Sc., 213:418, April 1947.

Acute Volvulus of the Cecum — A Method of Diagnosis, with Report of a Case

Harold H. Lindner, M.D., and Sanford Marcus, M.D.,
San Francisco

ACUTE volvulus of the cecum is a rarely encountered clinical entity. Fewer than 400 cases have been reported in the literature since the disease was first described by Rokitansky[1] in 1837. It is remarkable that the great majority of these cases have been reported from Russia and the North European countries. To date, no satisfactory explanation has been offered as to this unusual geographical distribution. The lesion has been estimated to be accountable for from 1 per cent to 11.6 per cent of all cases of acute intestinal obstruction, not including strangulated external hernia. The figure of 1 per cent represents that given by American observers. There appears to be no characteristic age incidence, but the disease occurs oftener in males than in females, in a ratio of 3:1. In the older reports of series of cases, mortality figures were as high as 50 per cent where the patients were treated surgically, and as high as 100 per cent with conservative treatment. Today a fair generalization is that the longer operative intervention is delayed, the higher will be the operative morbidity and mortality.

CASE REPORT

A 37-year-old native American housewife entered the hospital at 6 p.m. on November 12, 1947, complaining of cramping abdominal pain which had been present since 10 o'clock the previous night. The family history was non-contributory. The patient had never been pregnant, never had an operation, and her general health had been fairly good, although she was quite thin and had never been able to properly gain weight. She stated that she had had no previous attacks of this character but for the preceding two or three weeks had been having two or three loose bowel movements each day, with some mild cramping. There had been no blood or mucus in the stool. The present pain developed suddenly and had persisted, with frequent cramplike exacerbations. The patient said she had vomited four times before entry and had noticed distention of the abdomen.

Findings on physical examination were essentially normal, save for the abdominal findings. The blood pressure was 150 mm. of mercury systolic and 90 diastolic. The abdomen was moderately distended, with a sausage-shaped mass present in the mid-lower quadrant running transversely across the abdomen from right to left just below the umbilicus. The abdomen was diffusely tender and there was pronounced rebound tenderness.

Roentgenograms taken at this time showed a large closed-loop type of bowel obstruction, and it was the authors' opinion that there was volvulus of either the cecum or the sigmoid colon. A Harris tube was passed orally and a colonic flush given rectally, with no relief of the distention. Fluids were given intravenously. The blood count taken at this time showed 3,800,000 erythrocytes with hemoglobin value of 80 per cent, and 10,500 leukocytes with 89 per cent polymorphonuclear cells.

Because there was some difficulty in persuading the patient's family to permit operation, this had to be postponed until the following morning. During the night the cramplike abdominal pain continued and a roentgenogram taken early on November 13, 1947, showed an increase in size of the dilated closed loop of bowel.

The patient was given a transfusion of blood, and when the peritoneal cavity was opened a moderate amount of serosanguineous fluid was found to be present. A large mass about the size of two fists lay transversely in the abdominal cavity at the level of the umbilicus. This mass consisted of the cecum and the proximal half of the ascending colon,

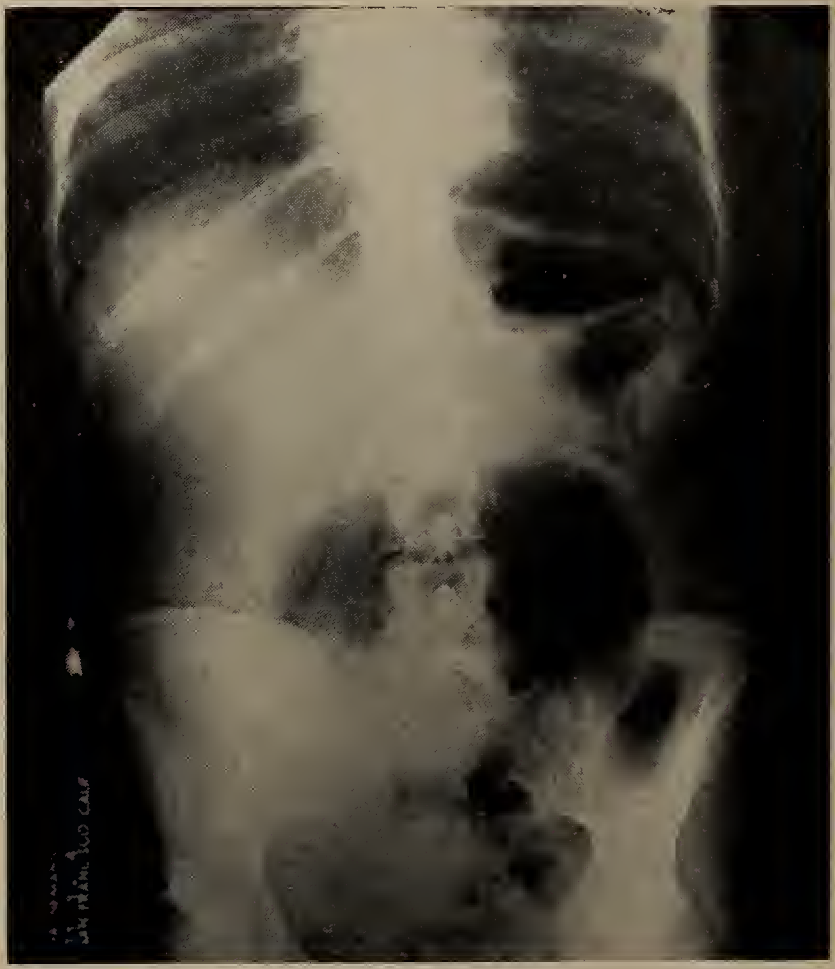


Figure 1.—Twelve hours after onset of pain. Note dilated loop of large bowel lying on left side of abdomen.

Presented before the Section on General Surgery at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

From the Department of Surgery, Mt. Zion Hospital, Service of Dr. Franklin I. Harris.

which had rotated clockwise upon itself for 180 degrees. The walls of the cecum and the colon were red and edematous, but no actual gangrenous areas were present. The ileum appeared normal and there were no large nodes present in the mesentery of the ileum. The remainder of the abdominal viscera were normal, including the large bowel which was patent throughout beyond the site of the twist. The volvulus was easily untwisted. No attempt was made to fix the cecum or colon, due to the poor condition of the bowel wall. Following the release of the volvulus, pressure on the dilated cecum sent large quantities of gas coursing through the large bowel. Immediately following the operation a check-up x-ray film of the abdomen showed adequate air throughout the large bowel, with relief of the obstruction.

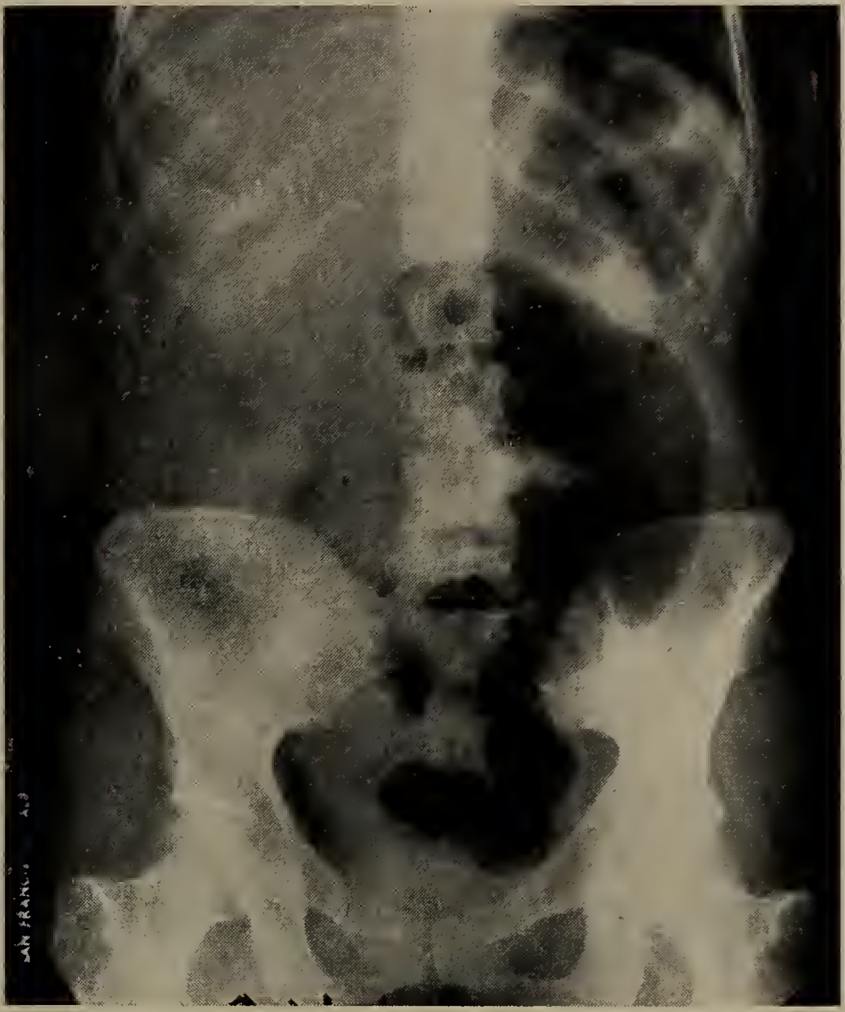


Figure 2.—Sixteen hours after onset of pain. Loop still on left side, larger and ascending in abdomen.

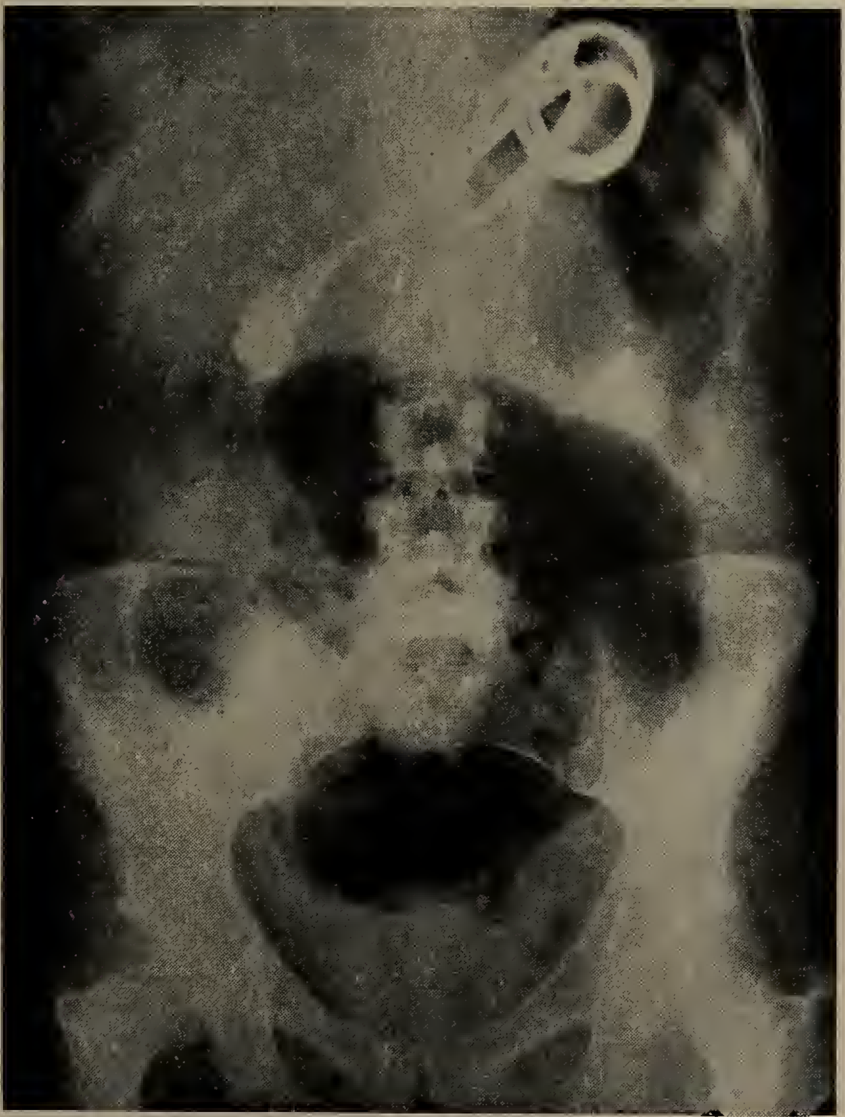


Figure 3.—Twenty-four hours after onset of pain—loop not relieved by intestinal intubation.

DISCUSSION

In the authors' opinion, volvulus of the cecum and ascending colon, one of the rarer causes of acute intestinal obstruction, is a disease which in many instances can be properly diagnosed before operation. This is contrary to the views of most of the authors of recent papers on the subject. Sweet[2] stated that the "diagnosis is rarely made before operation or autopsy." The authors feel that two most important diagnostic aids are (1) the taking of a proper history and (2) a proper interpretation of x-ray films of the abdomen. In line with the taking of proper history, inquiry must be made as to previous attacks of sharp, cramplike abdominal pain accompanied on occasion by some distention and even occasionally by the presence of a lower abdominal mass. Since the pathological rotation and twisting of the ileocolic loop is dependent upon anatomical variations of malrotation, maldescent, or malfixation of the right portion of the colon, one may assume that this portion of the bowel might have been subject to volvulus of varying degrees at several previous times during the patient's life. When the episodes of pain and distention can be linked to preceding bouts of constipation, diarrhea, violent exercise, or sudden change of position, chronic or subacute ileocolic volvulus, with self-relief of the twist, should be suspected.

Early plain films of the abdomen are important, particularly in correlation with the history and physical findings. In all cases, intestinal volvulus becomes a closed-loop obstruction and rapid distention of the strangulated loop and

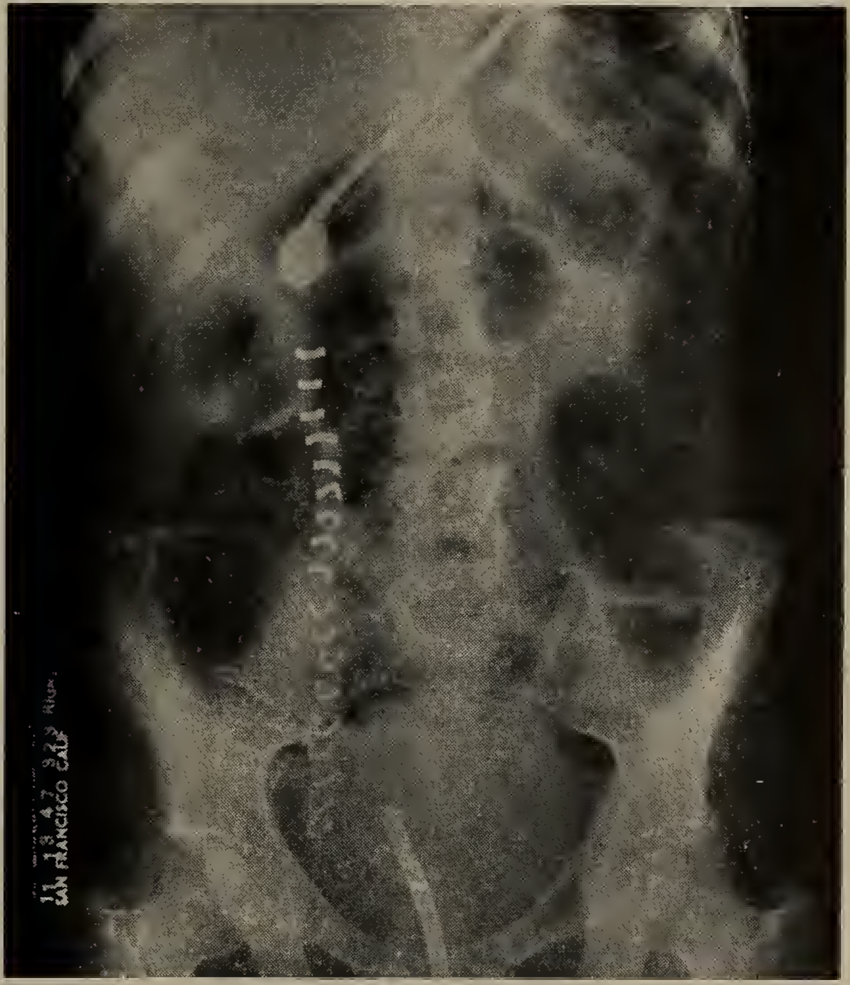


Figure 4.—Picture taken immediately following operation; obstruction relieved; air throughout large bowel.

of the abdomen then takes place. This is obvious early in the x-ray films. If the enlarged loop does not respond to the deflating measures of intubation with a Harris tube or enemata and rectal tubes, suspicion of closed-loop obstruction should be aroused. In the case here reported the x-ray films, taken at ten-hour intervals, showed this quite well. They showed a gain in size of the closed-loop obstruction despite these measures. As a general rule, obstruction of the large bowel gives symptoms far less acute than does a high obstruction of the small bowel. However, when the large bowel obstruction is of the closed-loop variety, that is, a volvulus either of the ileocolic segment or of the sigmoid, the attendant symptoms are as rapid in onset and as severe in course as are those of upper small bowel obstruction. This too, then, is of diagnostic significance in volvulus of the large bowel.

It will be noted in the x-ray films that the dilated closed loop of obstructed bowel occupies the mid- and left lower quadrant of the abdomen, lying convexly to the left. This was borne out by the physical findings in the abdomen of the patient, the palpable mass lying transversely across the abdomen to the left. Because in by far the greater percentage of cases of volvulus of the cecum, the volvulus rotates in a clockwise direction to the left around the apex of the lowest portion of the fixed ascending colon, it is easy to see the reason for this. Volvulus of the sigmoid colon presents no such picture. The large dilated closed loop in this syndrome rises from the pelvis from a triangular terminal area and balloons into a loop which may occupy any portion of the lower abdomen, right or left. Volvulus of the terminal portion of the ileum, which accounts for about 47 per cent of all cases of intestinal volvulus as against 42 per cent for volvulus of the cecum and 11 per cent for volvulus of the sigmoid colon, may cause some diagnostic difficulty. In fact, one roentgenologist who was consulted in the case here reported, read the films as volvulus of the lower portion of the ileum. In such circumstances x-ray films should be of assistance if the haustral markings of the colon can be made out. In addition, the colon will usually show larger fluid levels present at an early stage of obstruction than will the small bowel.

490 Post Street.

REFERENCES

1. Rokitansky, C.: Intestinal strangulation, Arch. Gen. Med., 14:202, 1837.

2. Sweet, R. H.: Volvulus of the cecum, acute and chronic, New Eng. J. Med., 213:287, 1935.

Niemann-Pick's Disease and its Relationship to the Lipoidoses

Ralph E. Knutti, M.D., *Los Angeles*

The group of lipoid diseases known as the xanthomatoses includes: (1) the primary type which is associated with cholesterosis, (2) the secondary type due to hyperlipemia, (3) the various types of xanthomatous deposits in tumors and inflammatory tissue, and (4) the metaplastic reticular and histiocytic diseases of Gaucher and Niemann-Pick which are associated with the specific lipoid materials kerasin and sphyngomyelin respectively. To these might be added the condition of familial amaurotic idiocy or Tay-Sach's disease. The term xanthomatosis is an unfortunate one to use in describing these diverse diseases. From its derivation it implies a yellow color such as that produced by cholesterol and bears no relationship to the various types of lipoids and lipochromes included under its heading. Pick himself[5] decried the term and suggested "lipoidosis" as a better one. Other authors[3, 8] feel that the term "xanthomatosis" should be restricted to those conditions in which cholesterol is the predominant lipoid. The lipoid nature of the chemical substances involved in the group is illustrated in Table 1.

The pathogenesis of Niemann-Pick's and Gaucher's diseases appears to be due to a disturbance of lipoid metabolism, the nature of which is controversial. Improved methods of chemical fractionation of lipoids in tissues have added much to knowledge of the subject. Gaucher felt that the disease bearing his name was a splenic neoplasm. Pick[4] suggested that hypercerebrosidemia with secondary storage of cerebrosides in the reticulum cells caused the condition, and he was the first proponent of the metabolic nature of this group of diseases. He also disagreed that Niemann-Pick's or Gaucher's disease represent lipoid histiocytosis. Thannhauser[7] and his associates elaborated the cellular theory,

TABLE 1.—*Chemistry of Lipoidoses*

I. FATS: Glycerin $\left\{\begin{array}{l}\text{Fatty acid}\\ \text{Fatty acid}\\ \text{Fatty acid}\end{array}\right.$

II. LIPOIDS:

A. STEROLS

Cholesterol and its derivatives (Hand-Schuller-Christian)

B. PHOSPHATIDS

1. Glycerin $\left\{\begin{array}{l}\text{Fatty acid}\\ \text{Fatty acid}\\ \text{PHOSPHORIC ACID+choline=LECITHIN}\\ \qquad\qquad\qquad\qquad\text{or}\\ \qquad\qquad\qquad\text{+ethanolamine=CEPHALIN}\end{array}\right.$

2. Sphingosin $\left\{\begin{array}{l}\text{Fatty acid}\\ \text{PHOSPHORIC ACID+choline=SPHINGOMYELIN (Niemann-Pick)}\end{array}\right.$

C. CEREBROSIDES

Sphingosin $\left\{\begin{array}{l}\text{Fatty acid}\\ \text{GALACTOSE=KERASIN (Gaucher)}\end{array}\right.$

From the Departments of Pathology, Children's Hospital, and the University of Southern California School of Medicine, Los Angeles.

Presented before the Section on Pediatrics at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

TABLE 2.—*Chemical Analyses in Niemann-Pick's and Tay-Sach's Diseases* (After Thannhauser)
Figures represent mg. per 100 cc.

	Spleen			Liver			Brain		
	Normal	Tay-Sach's	Niemann-Pick's	Normal	Tay-Sach's	Niemann-Pick's	Normal	Tay-Sach's	Niemann-Pick's
Total cholesterol	1.8- 2.4	3.10	6.73	2.0-2.6	3.78	7.0	7.3-15	9.90	6.45
Free cholesterol	1.6- 1.1	1.36	6.70	1.0-1.1	0.47	4.50	1.3-4.6	4.10	5.43
Cholesterol esters	0.7- 1.3	1.74	0.03	1.5-2.2	3.31	2.50	6.1-10.30	5.80	1.02
Total phospholipids	5.5-11.0	8.30	42.50	9.0-11.0	9.26	37.1	25-30	19.68	61.0
Sphyngomyelin	0.7- 1.0	1.04	32.70	0.3-0.5	0.55	25.90	4.5-7.0	7.04	4.84
Cephalin	1.5- 7.0	4.80		3.0-5.5	0		12-25		
Lecithin	3.0- 4.0	2.46		3.0-6.0	8.71		4.0-6.0		
Total fatty acids	4.0- 6.2	5.97		8.6-13.0	27.40				

namely, that the metabolic processes involved are within the cells. There is considerable evidence to support their conception of the pathogenesis of these diseases:

1. In Gaucher's disease kerasin is not increased in the serum.[6]
2. The kerasin present is found only within the reticular cells themselves.
3. An imbalance of the enzymes cerebrosidase and phosphorycholinesterase, normally present in cells, has been demonstrated,[9] and this imbalance is associated with the abnormal formation of sphyngomyelin or kerasin as the case may be.

Niemann-Pick's disease is the rarest of these conditions. Up to 1945, 60 cases[1, 2] had been reported. There were partial lipoid analyses in 12 of those cases, complete lipoid studies in nine. It is a disease of infancy, usually occurring in Jewish infants, is only slightly more frequent in females than in males[2] and terminates in death before the third birthday. In 15 of the 59 cases reviewed by Canmann[1] definite familial tendencies were shown. In common with other lipoid storage diseases, there is the characteristic occurrence of large abnormal lipoid-containing cells in various organs with enlargement of the liver and spleen. Clinically, it is frequently difficult to differentiate from Gaucher's disease. Other conditions which may confuse the diagnosis may be amaurotic familial idiocy (Tay-Sach's disease), von Gierke's disease, leukemia, and certain tumors of the liver (hepatoma, neuroblastoma). These latter conditions usually can be easily ruled out by clinical findings or suitable laboratory tests.

A case of Niemann-Pick's disease in the records of the Children's Hospital, Los Angeles, illustrates some of the factors involved in the clinical and pathological aspects of the lipoid storage diseases.

CASE HISTORY

A seven-month-old Jewish male was admitted to Children's Hospital with eczema of the face and scalp of three months' duration. He had been born after a full term pregnancy and normal labor. At birth an enlarged liver and spleen were noted but the patient was otherwise normal. Birth weight was 7 pounds 5 ounces. He was the second child of normal parents and had a four-year-old brother in good health. The feeding history and weight gain had been satisfactory, but at four months the child was unable to hold up its head. A raised, scaly patch developed on the left cheek, and gradually spread to the face and scalp. Therapy had been of no avail, and at seven months of age the patient was unable to hold up his head or sit up.

Physical examination revealed a well nourished infant who showed little reaction to objects brought near his face. There was an erythematous papular rash, eczematoid in nature, over the left cheek and scalp, with excoriations due to scratching. Questionable separation of the sutures of the skull was noted on palpation. No teeth were present. The heart was normal, but auscultation of the chest disclosed coarse wheezing rales bilaterally. The liver edge was palpable 4 to 5 cm. below the right costal margin, and the spleen was palpable also. Bilateral hydrocele was present. The skin over the legs, ankles and feet was cold and firm, and the soles of the feet were red.

Neurologic examination revealed that the pupils reacted to light, in spite of pronounced diminution in visual acuity. Nystagmus on lateral gaze was present. Fundoscopy by an ophthalmologist disclosed slight bilateral optic atrophy, and no cherry red spot of the macula was present. There was no rigidity or hypermotility of the extremities and, except for slight hypoactive deep tendon reflexes, no other abnormality was noted.

Laboratory studies on admission: The urine was normal. A hemogram showed a hemoglobin value of 70 per cent, erythrocytes numbering 4.6 million, and leukocytes 10,200 with 56 per cent lymphocytes, 25 per cent polymorphonuclear cells, 11 per cent eosinophils and 8 per cent monocytes. Results of Kahn, Wassermann and tuberculin tests were negative. The blood cholesterol was 156 mg. per 100 cc.

A pneumoencephalogram was performed. No air entered the subarachnoid space; both lateral ventricles were enlarged, the left more than the right, with a "bat-wing" appearance; the third ventricle was also dilated. A skeletal survey showed the skull and long bones to be normal.

The child remained afebrile throughout the hospital stay of 11 days in spite of a slight upper respiratory infection near the end of the period. Repeated hemograms showed no essential change, although one smear hinted at vacuolization of the lymphocytes and monocytes. The child was discharged with no essential change in status.

Three days later he was readmitted with a flare-up of the eczema and an increase in severity of the respiratory infection. He was acutely ill with a temperature of 102°. The results of physical examination were essentially as before except for changes in the ears and chest. Both tympanic membranes were inflamed and the right chest was flat to percussion and inspiratory and expiratory crepitant rales were heard. An x-ray film of the chest disclosed consolidation in the right lung, and a hemogram revealed leukocytosis.

During the first week the temperature ranged from 102° to 105°. On the seventh day, myringotomy was performed bilaterally, with rapid defervescence. Culture of the pus obtained from the left ear showed staphylococcus aureus and pneumococcus type XXIII. For a week the child appeared much improved, but the fever rose again, with a progressive downhill septic course, and after one month in the hospital, the patient died.

At autopsy the positive findings consisted of emaciation, dehydration and multiple eczematous lesions of the scalp. The right lung was bound to the parietal pleura by dense fibrous adhesions, and some pus pockets were found among them. The liver extended 7.5 cm. below the costal margin, and the spleen 3 cm. below the left costal border. The heart was hypertrophied and weighed 60 gm. (normal weight for the age, 37 gm.). The right lung showed fibrous tags on the pleural surface and almost complete consolidation. The liver weighed 525 gm. (normal weight, 260 gm.). The surface was smooth, glistening and yellowish brown. The lobular architecture was indistinct. The cut surface was glistening in appearance. The spleen weighed 30 gm. (normal weight, 20 gm.). The surface was purple, smooth and glistening. The pulp scraped readily with a knife. The malpighian bodies were quite prominent. Both kidneys were enlarged, somewhat paler than normal. There was a thrombus in the left renal vein. Bilateral hydrocele was present. The brain weighed 870 gm. (normal weight, 750 gm.). The meningeal vessels were engorged. There was atrophy of the convolutions of the left cerebral hemisphere, particularly in the temporal and parietal regions around the sylvian fissure. The left lateral ventricle was larger than the right and the third ventricle was considerably dilated, measuring 1 cm. in its transverse diameter and 2.5 cm. in the vertical diameter. The cerebellum was not remarkable. Other organs were grossly negative.

Positive microscopic findings included acute bronchopneumonia. In addition, there were large foamy-appearing cells in alveoli and in alveolar walls. The liver parenchyma was displaced by foci of large vacuolated cells. The splenic architecture was obscured by numerous large pale foamy cells (Figure 1). Similar cells were noted in the adrenal cortex. The thymus, lymph nodes, kidneys and sections from the large and small intestine showed infiltrations with foam cells, and the bone marrow was diffusely infiltrated with similar cells (Figure 2). Sections from various portions of the brain showed ganglion cells that were pale, swollen and granular. Some of these were enlarged three to four times normal size; others were slightly larger than normal, but showed definite vacuolization of the cytoplasm and club-like ends. The nuclei, when present, had a tendency to be pushed to one side. Many large foamy cells in which no nuclei could be identified were present. They were usually in the vicinity of the ganglion cells, but it could not be definitely determined whether they represented ganglion cells (Figure 3). There was no inflammatory reaction. The ependyma was not remarkable. The meninges were essentially normal. No evidence of necrosis of any of the cerebral or cerebellar tissue was noted. Smith-Dietrich stains of the foam cells gave a positive reaction. Unfortunately chemical analyses of the organs were not made.

DISCUSSION

In the case presented there were neurologic signs suggestive of Tav-Sach's disease. This is not a unique finding in Niemann-Pick's disease and has led to considerable speculation concerning a common etiology. In general the points of similarity in the two conditions are: (1) Occurrence in infancy,(2) high incidence in Jews, (3) familial constitutional character, (4) loss of motor and physical functions, (5) lipoidal character of cells in central nervous system, (6) macular degeneration (cherry red spot) in certain cases of Niemann-Pick's disease, (7) absence of macular degeneration in certain cases of Tay-Sach's disease.

Factors against a common pathogenesis in the two diseases are: (1) Involvement of bone marrow, liver, spleen, lymph nodes and other organs as well as the brain in Niemann-Pick's, but not in Tay-Sach's disease, (2) absence of descending degeneration of neurons in Niemann-Pick's disease, (3) differences in lipoid analysis of various organs from the two conditions.

The diagnosis of this group of diseases is dependent upon a correlation of the clinical findings and pathological studies, including chemical analysis. Bone marrow study during life usually points out the lipoid nature of the disease, and frequently suggests the disease in question. Hence it is of great importance. Postmortem examination shows the sites of lip-

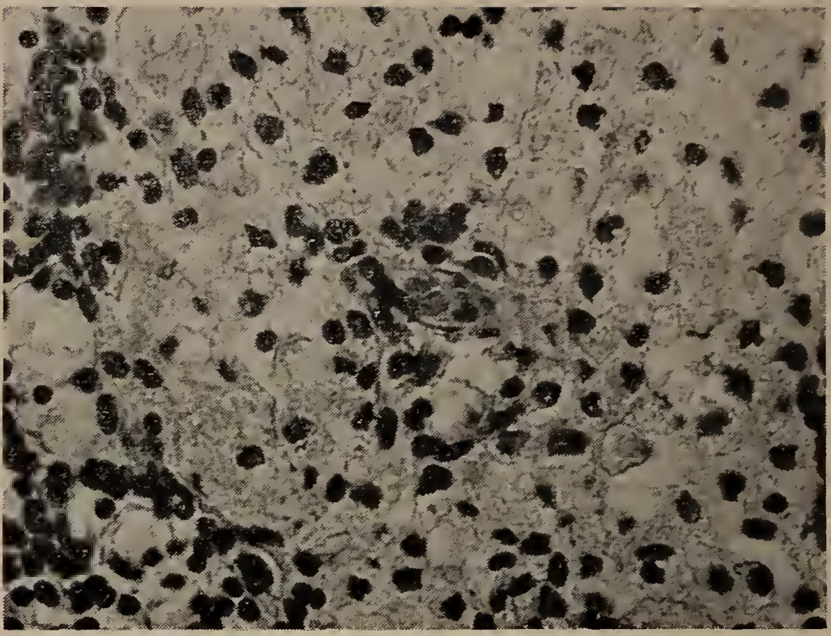


Figure 1.—High power view, spleen, showing large foamy cells.

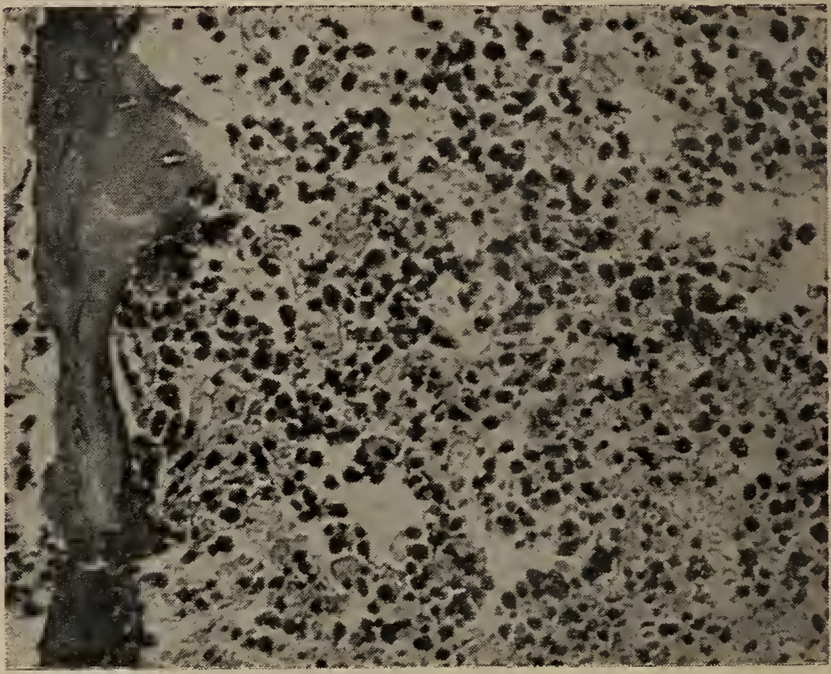


Figure 2.—Bone marrow, sternum, showing almost complete replacement by foam cells.

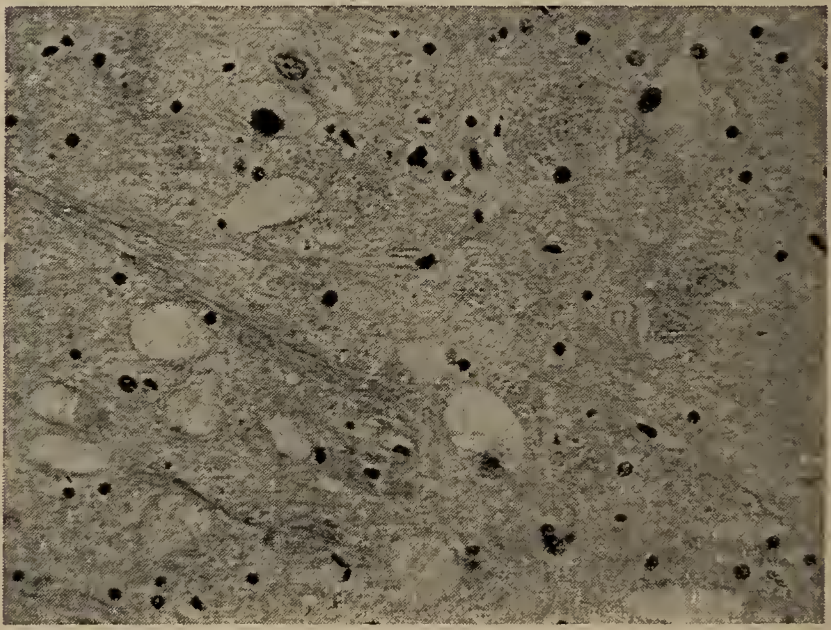


Figure 3.—Medulla, showing swollen foamy ganglion cells, some with foamy granular nuclei.

oid deposit, and often by means of appropriate staining techniques, a diagnosis is made. Chemical analysis of the organs is of the greatest importance, and it is interesting to note that lipoid fractionations have been done in so few cases. Data derived from this technique will add to knowledge of the mechanism of variations of this class of disorders, and the ultimate diagnosis should depend on such an analysis.

SUMMARY

A case of Niemann-Pick's disease is presented. The findings in the brain closely resembled those described in Tay-Sach's disease. A discussion of the essential lipoid diseases is presented, and the importance of chemical fractionation of the visceral lipoids is stressed.

REFERENCES

1. Canmann: Niemann-Pick's diseases, J. Pediat., 24:335-347, March 1944.

2. Murray, H. A., and Bernstein, T. C.: Niemann-Pick's disease, Arch. Pediat., 63:497-503, Oct. 1946.

3. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Vol. 1:539, The Williams and Wilkins Company, Baltimore, 1946.

4. Pick, L.: Classification of diseases of lipoid metabolism and Gaucher's disease, Am. J. Med. Sc., 185:453-469, April 1933.

5. Pick, L.: Niemann-Pick's disease and other forms of so-called xanthomatosis (Dunham lecture), Am. J. Med. Sc., 185:601-616, May 1933.

6. Thannhauser, S. J., Benotti, J., and Remstein, H.: Studies on animal lipids: lecithin, cephalin, and sphingomyelin content of normal human organs, J. Biol. Chem., 129:709, Aug. 1939.

7. Thannhauser, S. J.: Lipoidoses, Oxford Medicine, Christian, Vol. IV, Part II, p. 287, Oxford Univ. Press.

8. Thannhauser, S. J., and Magendantz, H.: Different clinical groups of xanthomatous diseases; clinical physiological study of 22 cases, Ann. Int. Med., 11:1662, March 1938.

9. Thannhauser, S. J., and Reichel, M.: J. Biol. Chem., 113:317, 1936.

* * *

California MEDICINE

OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8 PHONE DOUGLAS 2-0062

Editor, Dwight L. Wilbur, M.D. *Assistant to the Editor*, Robert F. Edwards
Editorial Executive Committee
Albert J. Scholl, M.D., Los Angeles H. J. Templeton, M.D., Oakland
Edgar Wayburn, M.D., San Francisco

For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIALS

A.M.A. Clinical Session

On December 9 the American Medical Association rang down the curtain on its third Clinical Session, this one having been held in Washington, D. C. The meeting, a complete dress rehearsal for the coming Annual Session, included this year not only sessions of the House of Delegates, but also scientific meetings, scientific exhibits and technical exhibits. It was well attended and those present appeared satisfied with the results attained.

In the House of Delegates, three items loomed out above all else. These were (1) the demand to broaden and strengthen the A.M.A.'s office in Washington, (2) the establishment of dues of $25 a member for 1950, and (3) the reiteration of the principles in the Hess Committee report adopted at the 1949 Annual Session last June. The first two of these are in direct confirmation of the public educational program of the A.M.A., first as a means of implementing the program and second as a means of financing it. The Hess Committee report will be dealt with separately in this issue.

The demand for improving the Washington office situation was heard throughout the meeting, and the House of Delegates tackled the problem realistically. The A.M.A. has maintained an office in the national capital for several years, primarily as a listening post; the membership is now asking, through its elected delegates, that the office pursue a more vigorous program. It is hoped that bills can be more promptly analyzed and that the A.M.A. position with regard to specific legislative proposals can be quickly and effectively implemented. Some members of the House of Delegates look askance at such activities on the grounds that they constitute lobbying. On the other hand, it should be borne in mind that "lobbying" is subject to a variety of definitions and interpretations, not only in dictionaries but in state laws as well. In its truest sense, that of representing group opinion, it constitutes nothing more than the exercise of the right of appeal to the government, which is guaranteed Americans under the Bill of Rights.

To implement the decision regarding the Washington office, it was voted to set up a committee of members of the Board of Trustees and of the House of Delegates, similar to the Coordinating Committee which has been so successful in advising and guiding the national education campaign. The roster of this committee has not yet been announced but it is understood to comprise men of unquestionable standing and capability.

The adoption of $25 annual dues for members of the A.M.A. for 1950 puts into practical application the principle adopted a year earlier, when the euphemism of "assessment" was used; this year, backed by the overwhelming numbers of members who had gladly and willingly paid the 1949 "assessment," the House of Delegates in the interest of uniformity voted dues. The sum in prospect from these dues is estimated as sufficient to permit the A.M.A. to carry on its public education campaign.

In the decisions to strengthen the Washington office and to collect dues, the A.M.A. took two positive strides forward in the Clinical Session. The carrying out of these procedures will let the American people and the Congress know that medicine knows its business and is going to carry it out as a public trust in the interest of better public health.

The Hess Committee Report

One of the most-discussed items at the recent A.M.A. Clinical Session was the report of the Hess Committee of June 1949. This committee had been given the task of considering ways and means of dealing with hospitals which were, in effect, practicing medicine. The hospital departments primarily concerned were those of radiology, pathology and anesthesiology. In these departments, in some hospitals, medical services were actually being sold to hospital patients at a greater fee than was paid to the physician rendering the service.

The Hess Committee reported to the 1949 annual A.M.A. session with the suggestion that Item V(3) of the "Essentials of a Registered Hospital," adopted by the A.M.A. Council on Medical Education and Hospitals, be enforced. This item reads: "It shall not be the policy of the hospital to make a profit from the department of radiology." While the statement applies directly to radiology, the principle behind it is equally aimed at all branches of medical practice.

To implement this provision, the Hess Committee recommended that the Judicial Council of the A.M.A. be empowered, upon due action by county and state medical associations, to determine which of the members of the A.M.A. were unethical or which hospitals might be violating the clause. The Judicial Council, in the latter instance, would report to the Council on Medical Education and Hospitals, which would have the power to remove the name of the hospital from its registration list.

On consideration of this recommendation, the Board of Trustees sought legal advice and was given an opinion which held that such a procedure might be in violation of legal statutes. The board thereupon recommended to the House of Delegates that the Hess Committee report, which had been adopted by the 1949 House of Delegates, be rescinded. That was the question before the Clinical Session.

After considerable discussion before the Trustees and before a reference committee, the House of Delegates was given the recommendation that the Hess Committee report be reconsidered, not rescinded. On a substitute motion, the reference committee's report was amended to provide that the original Hess Committee recommendations not be put into effect until after the 1950 Annual Session and that, prior to that time, legal aspects of the matter be reconsidered by the original Hess Committee for report to the 1950 House of Delegates. This amendment was adopted unanimously.

The interesting portion of the amendment is the statement which *reiterates the belief of the House of Delegates in the theory underlying the original report and the principles enunciated in it.* The House of Delegates has placed itself squarely on record that the practice of medicine is a personal professional activity and not a proper corporate endeavor. If radiology, pathology and anesthesiology have already succumbed, what is to prevent surgery, obstetrics and general practice coming next?

We will await with great interest the recommendations of the reappointed Hess Committee on ways and means of implementing the original report without infringing any statutes in so doing. It is sincerely to be hoped that a clear-cut answer on this question may be found and adopted.

* * *

Letters to the Editor . . .

"Non-Paralytic Poliomyelitis"

From cases diagnosed as "non-paralytic poliomyelitis," "aseptic meningitis" or "fever of unknown origin," a new virus of current epidemiologic interest has been isolated by Melnick[2] and associates of the department of pediatrics, Yale University.

During the 1948 poliomyelitis epidemic in southern New England, feces were collected from 16 typical cases of non-paralytic illness. Injected intracerebrally into rhesus monkeys, all samples proved negative for poliomyelitis virus. Adopting the technique previously used by Dalldorf,[1] the samples were also tested on newborn mice. Swiss mice one to three days old were injected intracranially or intraperitoneally with each of the 16 samples. After an incubation period of two to ten days signs of disease developed in seven mice, manifested by weakness, ataxia and paralysis of one or more legs. Death usually took place within 24 hours.

In each case the outstanding necropsy finding was an extensive myositis of the skeletal muscles, especially in the limbs. In most of the cases lesions were also noted in the heart muscle and the brain.

Inoculation experiments on newborn mice showed that the infectious agent was present in the brain, skeletal muscles, heart, liver, spleen and intestinal contents. Aerobic and anaerobic cultures yielded no bacterial growth. Since the agent was readily passed through a Corning bacterial filter, it was presumably a virus. Sedimentation tests suggested that it is one of the smallest viruses. At 18,000 r.p.m. for 30 minutes but little virus is thrown down. From the resulting clear supernatant fluid, the agent was readily sedimented at 36,000 r.p.m. for 60 minutes.

The virus is neutralized by the convalescent serum of patients from which it was isolated, and by homologous antiserum prepared by repeated inoculation into animals. It is not neutralized by antiserum from animals hyperimmunized against poliomyelitis virus, mouse encephalomyelitis, mumps, herpes, lymphocytic choriomeningitis, encephalomyocarditis, louping ill, equine encephalitis, or Newcastle disease.

The new virus is non-infectious for rhesus monkeys and for adult mice. After oral administration to chimpanzees no recognizable symptoms develop. However, the virus may be recovered from their throat washing for eight days, and from their feces for as long as 12 days. Neutralizing antibodies absent before the oral administration are demonstrable on and after the 14th day.

One presumptive accidental human infection took place in Melnick's laboratory. One physician working with the new virus developed a "fever of unknown origin" lasting for eight days. His only noticeable symptom was a slight stiffness of the back. The new virus was repeatedly recovered from his feces and nasopharyngeal washings. Specific antibodies developed during his illness, reaching a neutralizing titer of 10,000 during convalescence.

Both the new virus and poliomyelitis virus have been recovered from pooled fecal samples collected in 1947 in Akron, Ohio, and in 1948 in Winston-Salem, N. C. The new virus has also been found in sewage collected in 1948 in Connecticut and North Carolina and in non-biting flies collected in Connecticut, North Carolina and Texas.

Cross neutralization tests have shown that there are at least two immunologically distinct strains of the new non-polio mouse-infecting virus. The Texas and North Carolina strains are apparently identical. Both are distinct from the Connecticut strain.

Recognition of Melnick's non-polio non-paralytic virus as a possible diagnostic hazard in polio epidemics is of major clinical interest.

REFERENCES

1. Dalldorf, G., and Sickels, G .M.: Science, 108:61, 1948.
2. Melnick, J. L., Shaw, E. W., and Curnen, E. C.: Proc. Soc. Exp. Biol. and Med., 71:344, July 1949.

W. H. Manwaring, M.D.
Stanford University, Calif.

* * *

CALIFORNIA MEDICAL ASSOCIATION

R. STANLEY KNEESHAW, M.D.....President
DONALD CASS, M.D.....President-Elect
LEWIS A. ALESEN, M.D.....Speaker
DONALD A. CHARNOCK, M.D.....Vice-Speaker
SIDNEY J. SHIPMAN, M.D.....Council Chairman
L. HENRY GARLAND, M.D.....Secretary-Treasurer
H. GORDON MacLEAN, M.D.....Chairman, Executive Committee
DWIGHT L. WILBUR, M.D.....Editor
JOHN HUNTON, Executive Secretary.....General Office, 450 Sutter Street, San Francisco 8
ED CLANCY, Field Secretary.....Southern California Office, 417 South Hill Street, Los Angeles 13. Phone: MAdison 8863

NOTICES AND REPORTS

A.M.A. Dues—1950

Dues of $25 a member were voted by the American Medical Association for 1950 at the December Clinical Session in Washington. The manner of collection and reporting of dues is left up to the component state associations.

In California the same method will be used as in 1949, namely, the collection of the A.M.A. dues by the county society secretaries, along with county and state dues. Under this procedure in 1949, California ranked right up in front in the percentage of collections. This same proud position must be maintained in 1950.

The A.M.A. national campaign has made remarkable strides in its public educational work in 1949. In crucial 1950, the good work is to be kept up and California's good name must be preserved in the financing of this all-important work.

Council Meeting Minutes

Tentative Draft: Minutes of the 366th Meeting of the Council of the California Medical Association at the St. Francis Hotel, San Francisco, November 20, 1949.

The meeting was called to order by Chairman Shipman in Room 210 of the St. Francis Hotel, San Francisco, at 9:30 a.m., Sunday, November 20, 1949.

Roll Call:

Present were President Kneeshaw, Speaker Alesen, Vice-Speaker Charnock, Councilors Shipman, Ball, Crane, Henderson, Anderson, Ray, Montgomery, Lum, Pollock, Green, Bailey, West, MacLean, Frees and Thompson; Secretary Garland and Editor Wilbur. Absent, President-Elect Cass (illness).

A quorum present and acting.

Present by invitation were Dr. D. H. Murray, chairman of legislation; John Hunton, executive secretary; William P. Wheeler, assistant executive secretary; Howard Hassard, legal counsel; Ed Clancy, field secretary; Ben H. Read, executive secretary of the Public Health League of California; county society executive secretaries Frank Kihm of San Francisco, Rollen Waterson of Alameda, Glenn Gillette of Fresno, Vance Venables of Kern and Kenneth Young of San Diego; Mr. William M. Bowman, executive director of California Physicians' Service; Dr. Wilton L. Halverson, state director of public health; Messrs. Ned Burman and Clem Whitaker, Jr., of public relations counsel.

1. *Minutes:*

(a) On motion duly made and seconded, minutes of the 365th meeting of the Council, held September 24, 1949, were approved.

(b) On motion duly made and seconded, minutes of the 216th meeting of the Executive Committee, held November 10, 1949, were approved. (One item was held in abeyance but adopted by subsequent action.)

2. *Membership:*

(a) A report of membership as of November 18, 1949, was received.

(b) On motion duly made and seconded, 65 members whose 1949 dues had been received since the last Council meeting, were voted reinstatement as active members.

(c) On motion duly made and seconded in each instance, five members were elected to Retired Membership. These were:

Fresno County: Edwin Leland Mott.

Los Angeles County: Blanche C. Brown, Wilbur Lucas, Charles T. Sturgeon, Percival M. Williams.

(d) On motion duly made and seconded in each instance, 15 applicants were elected to Associate Membership. These were:

Alameda County: Herbert K. Abrams, John C. Dement, Arthur C. Hollister, Jr., Samuel J. Kimura, Henry G. Mello, E. Richard Weinerman.

Fresno County: Lee A. Stone.

Napa County: Willard B. Morell.

Orange County: Raymond Cecil Leer.

San Diego County: John Benvenuto.

San Francisco County: Morris Berk, Aaron E. Davis, Barbara Mullen, James Walsh Martin, Edith Sappington.

(e) On motion duly made and seconded in each instance, five applicants were granted a reduction of dues because of postgraduate study or protracted illness. These were:

Kern County: Leland S. Lewis.

Los Angeles County: Elwin Iris Conner, Irving Krakower.

Sacramento County: M. W. Haworth.

San Bernardino County: John Newell Little.

(f) In response to an inquiry, legal counsel stated that a new applicant for membership could not be elected and simultaneously granted a reduction of dues but could be elected to active membership and subsequently apply for a dues reduction.

3. *Financial:*

A report of bank balances as of November 18, 1949, was received and ordered filed. The executive secretary pointed out that $100,000 in U. S. Treasury bills was not needed at this time for operating expenses and it was regularly moved, seconded and voted to transfer this amount to the Trustees of the California Medical Association for investment in U. S. Treasury 2½ per cent bonds.

4. *Committee Reports:*

(a) Committee on Hospitals, Dispensaries and Clinics: This committee presented a report on the question of members of the Association serving as faculty members in a school of licentiates in another of the healing arts. After discussion it was regularly moved, seconded and voted to refer this matter to the Committee on Medical Education and Medical Institutions for further study.

(b) Blood Bank Commission: A report was read from Dr. John R. Upton, chairman of the Blood Bank Commission, to the effect that agreement had been reached on establishment of a tri-county community type blood bank in Santa Barbara, to serve Santa Barbara, Ventura and San Luis Obispo counties.

(c) Advertising Committee: Advertising offered to the Journal was submitted for consideration as to appropriateness and it was regularly moved, seconded and voted to recommend against its acceptance.

(d) Special Committee on Public Funds for Hospital Construction and Care of Indigents Through Private Facilities: This committee (Kneeshaw, Garland, Hassard) presented a proposed statement of principles on the use of state or federal funds for hospital construction, which, upon motion duly made and seconded, was adopted. A copy of this statement is appended hereto and made a part of these minutes.

The committee presented a second statement relative to the use of private facilities for the care of indigents whose responsibility rested in the counties. It was regularly moved, seconded and voted that all Councilors forward to the Secretary their comments and suggestions on this statement, for the consideration of the committee for reporting back to the next Council meeting.

(e) Executive Committee: The Secretary presented the recommendation of the Executive Committee for creation of an over-all Committee on Public Health and Public Agencies, the function of which would be to oversee and correlate the activities of existing committees under a plan of scope and activities to be developed. Such a plan is attached hereto and hereby made a part of these minutes. On motion regularly made and seconded, it was voted to create this committee, the membership of which is to be L. A. Alesen, chairman, C. V. Thompson and F. E. West, with the Council Chairman and the Secretary ex-officio with the power of vote.

(f) Benevolence Committee: Dr. Anderson gave a progress report in which he suggested a closer cooperation between the Benevolence Committee and the Los Angeles County Physicians' Aid Association. He discussed an increase in the amount allocated to the Benevolence Fund out of dues and asked that the Council consider at a future date the advisability of participating in plans being laid by the Los Angeles County Physicians' Aid Association for construction of a permanent home for needy physicians.

(g) Special Committee on Health Insurance Proposal: Dr. Lum, chairman (Ray and Ball, members) gave a progress report on a meeting with representatives of labor and insurance brokers relative to a proposal to establish a standard type of voluntary health insurance policy at a set schedule of fees for those below an established income ceiling. It was regularly moved, seconded and voted to authorize the committee to continue such discussions with this and other insurance groups.

5. *California State Department of Public Health:*

Dr. Wilton L. Halverson, State Director of Public Health, expressed pleasure at the appointment of the over-all Committee on Public Health and Public Agencies and invited the members to attend meetings of the State Board of Health. He reported that he had given the 1951 legislative plans of his department to the Assembly Interim Committee on Public Health, including (a) rabies control legislation, (b) modernization of code sections on communicable diseases, (c) modernization and revision of vital statistics legislation, and (d) revision of the clinical laboratories act.

Mr. Hassard referred to his earlier report on the Crippled Children's Act, on which he had conferred with Dr. Halverson, and it was agreed to turn this matter over to Dr. Alesen's committee.

6. *Proposal for Creation of Section on Diseases of the Chest:*

A proposal to establish a scientific section on diseases of the chest was discussed and it was regularly moved, seconded and voted to refer this to the Committee on Scientific Work.

7. *Proposal for Committee on Nursing Problems:*

A proposal to establish a committee on nursing problems was discussed and it was agreed to refer this to the Committee on Public Policy and Legislation. On motion regularly made and seconded, it was voted to meet informally with nurse representatives to discuss matters of mutual interest.

8. *World Medical Association:*

Dr. John W. Cline, one of the A.M.A. representatives in the World Medical Association, described the objectives of the organization and requested an appropriation of funds to help defray its expenses. On motion regularly made and seconded, it was voted to contribute $1,000 to the World Medical Association.

9. *Public Policy and Legislation:*

Dr. Murray and Mr. Read reported on the results of the recent election and discussed legislation now pending in Congress. It was regularly moved, seconded and voted to send a letter of commendation to Judge Gus Jones of the Arkansas Circuit Court on his stand against misuse of government police powers.

On motion duly made and seconded, it was voted to send explanatory material to the county medical societies, with the request that they discuss with their own Congressmen the issues in S. 1411 and S. 1453.

10. *American Public Health Association:*

Dr. William P. Shepard reported on the recent annual meeting of the American Public Health Association, at which he was one of two representatives of the Association.

11. *Committee for Cooperation with Health Agencies:*

Dr. John W. Cline, chairman, gave the report of this committee, which, upon motion duly made and seconded, was approved. The report is attached hereto and hereby made a part of these minutes.

12. *Public Relations:*

Messrs. Ned Burman and Clem Whitaker, Jr., of public relations counsel reported on the progress of the A.M.A. public education campaign.

13. *Industrial Medical Fees:*

Dr. MacLean gave the report of the Executive Committee on its meeting with insurance representatives and it was regularly moved, seconded and voted to authorize the committee to continue its negotiations for a new fee schedule.

14. *A.M.A. 1953 Annual Session:*

On motion duly made and seconded, it was voted to issue an invitation to the American Medical Association to hold its 1953 Annual Session in San Francisco.

15. *Pomona College Institute of Public Affairs:*

On motion duly made and seconded, it was voted to contribute $200 toward the expense of the Pomona College Institute of Public Affairs for a scheduled meeting to discuss private enterprise.

16. *Manual of Joint Measurement:*

The executive secretary reported that arrangements had been made for the publication of a manual of joint measurements for industrial injury cases, and it was regularly moved, seconded and voted to approve the proposed contract of publication.

17. *Committee on Rural Health:*

Dr. Carroll B. Andrews, chairman, requested authority for himself and a committee member to attend the A.M.A. rural health conference to be held in Kansas City in February 1950, and it was regularly moved, seconded and voted to authorize such attendance.

18. *Sale of Antihistaminics:*

A request to investigate the sale of antihistaminics because of their potential danger to automobile drivers and others was ordered referred to the Committee on Health and Public Instruction.

19. *New Mexico Physicians' Service:*

The executive secretary reported that a financial report of New Mexico Physicians' Service had been promised for early delivery and that it would reportedly show evidences of repayment of some of the funds advanced by the Association.

20. *Committee on History:*

Dr. George H. Kress, Honorary Historian, requested an appropriation of $600 for stenographic services and it was regularly moved, seconded and voted to approve this expenditure.

21. *Insulin for Diabetes:*

On motion regularly made and seconded, it was voted to instruct the secretary to prepare a memorandum in opposition to the publication of advice to discontinue the use of insulin in diabetes.

Adjournment.

There being no further business to come before the meeting, it was adjourned at 6:30 p.m.

SIDNEY J. SHIPMAN, M.D., *Chairman*
L. HENRY GARLAND, M.D., *Secretary*

In Memoriam

Abramson, Max Jacobs. Died in Los Angeles, November 12, 1949, aged 68, of chronic myelogenous leukemia. Graduate of the College of Physicians and Surgeons, Los Angeles, 1911. Licensed in California in 1911. Dr. Abramson was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Anderson, Harry Elden. Died in Culver City, October 26, 1949, aged 52, from a cerebral hemorrhage. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1924. Licensed in California in 1924. Dr. Anderson was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Babcock, Donald Tisdale. Died in Los Angeles, November 2, 1949, aged 52, from acute pancreatitis. Graduate of the Emory University School of Medicine, Atlanta, 1921. Licensed in California in 1923. Dr. Babcock was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Bittner, Clarence Lavan. Died in Sacramento, November 26, 1949, aged 62, of a heart ailment. Graduate of the Jefferson Medical College of Philadelphia, 1914. Licensed in California in 1915. Dr. Bittner was a member of the Sacramento Society for Medical Improvement, the California Medical Association, and a Fellow of the American Medical Association.

◆

Derrick, Joseph Stephen. Died in Los Angeles, November 16, 1949, aged 67, of a heart attack. Graduate of Tufts College Medical School, Boston, 1907. Licensed in California in 1909. Dr. Derrick was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

◆

Gibbons, Morton Raymond. Died in San Francisco, November 8, 1949, aged 76, of acute monocytic leukemia. Graduate of the Cooper Medical College, San Francisco, 1897. Licensed in California in 1898. Dr. Gibbons was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Lee, Helen. Died in San Jose, October 28, 1949. Graduate of the University of Michigan Homeopathic Medical School, Ann Arbor, 1905. Licensed in California in 1906. Dr. Lee was a member of the Santa Clara County Medical Society, the California Medical Association, and the American Medical Association.

◆

Linde, Frederick George. Died in San Francisco, November 7, 1949, aged 59, of a heart attack. Graduate of the University of California Medical School, Berkeley-San Francisco, 1916. Licensed in California in 1916. Dr. Linde was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Lowy, Emil. Died in San Francisco, September 6, 1949, aged 63. Graduate of Medizinische Fakultät de Universität, Wien, 1913. Licensed in California in 1940. Dr. Lowy was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

◆

McGinty, Arthur Thomas. Died in San Jose, November 3, 1949, aged 75. Graduate of the University of California Medical School, Berkeley-San Francisco, 1902. Licensed in California in 1902. Dr. McGinty was a member of the Santa Clara County Medical Society, the California Medical Association, and the American Medical Association.

◆

Parker, Truman Alfred. Died in La Jolla, September 4, 1949, aged 74, of myocarditis and arteriosclerosis. Graduate of the University College of Medicine, Richmond, 1899. Licensed in California in 1914. Dr. Parker was a retired member of the San Diego County Medical Society, the California Medical Association, and an Associate Fellow of the American Medical Association.

◆

Poheim, Joseph Francis. Died in San Francisco, November 13, 1949, aged 72, of cirrhosis of the liver. Graduate of the Cooper Medical College, San Francisco, 1898. Licensed in California in 1898. Dr. Poheim was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

◆

Rydholm, Carl Oliver. Died in Pomona, November 6, 1949, aged 48, of a heart attack. Graduate of Northwestern University Medical School, Chicago, 1932. Licensed in California in 1932. Dr. Rydholm was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

◆

Sullenberger, Perry K. Died in Eureka, October 27, 1949, aged 30, of a cerebral vascular accident. Graduate of Northwestern University Medical School, Chicago, 1944. Licensed in California in 1947. Dr. Sullenberger was a member of the Humboldt County Medical Association, the California Medical Association, and the American Medical Association.

◆

Smith, James Franklin. Died September 27, 1949, aged 76. Graduate of the Cooper Medical College, San Francisco, 1894. Licensed in California in 1895. Dr. Smith was a retired member of the San Francisco County Medical Society, and the California Medical Association.

◆

Thorpe, Arthur Clyde. Died in Los Angeles, November 9, 1949, aged 82. Graduate of the University of Minnesota Medical School, Minneapolis, 1897. Licensed in California in 1898. Dr. Thorpe was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Morton R. Gibbons

1873-1949

There recently passed from the medical scene in this state a man who commanded the respect and esteem of his confreres to a degree enjoyed by very few physicians in our time. By his forthright conduct in all matters, Morton Gibbons did credit to a pioneer medical family in which he was a member of the third generation.

He was graduated from Cooper (later Stanford) Medical School in 1897 and practiced medicine in San Francisco for half a century. Like his father and grandfather before him he became active in the affairs of organized medicine and in time came to be recognized as a man of singular fair-mindedness and sound judgment. Thus it happened that when the California Industrial Accident Law was passed about 1914, and the machinery established to effectuate it, Morton Gibbons, then in his early forties, was chosen as the first medical director. Here was a task to try the abilities of the most gifted medical administrator. By his tact and integrity Morton Gibbons succeeded where most others would have failed, and filled that difficult position until 1932.

During this period Dr. Gibbons did not relinquish his practice entirely, but devoted a few hours daily to his patients. And, as usual, he also found time for other activities, for his favorite pastime of yachting; as a director of the California Academy of Medicine, and also of his county medical society, which he served as president in 1923.

For the duration of World War I, Dr. Gibbons was on leave of absence from his position of medical director with the Industrial Accident Commission and entered the Army as a captain. Before the war's end he had been advanced to the rank of colonel.

In addition to the services to his county medical society already mentioned, Dr. Gibbons represented San Francisco in the House of Delegates of the California Medical Association. There he did outstanding work upon committees to which he was assigned; so, in an ever-widening circle, his capabilities were becoming recognized. As a tribute his colleagues elected him president of the State Association in 1930, a position which he filled with honor both to himself and to the society. Small wonder that Morton Gibbons advanced from one position of trust and responsibility to another. One glance at his kindly eyes, with the square jaw and firm mouth below, was sufficient to convince anyone that here was a man who would play fair, and hard; but, moreover, would demand and insist that others do the same.

About 1935 the political "do-gooders" began to bestir themselves and cast coveteous eyes at medicine as one of the easily secured stones in the construction of their welfare state. The counsel of Dr. Gibbons was invaluable in the long fight within the state association over the issue of compulsory vs. voluntary sickness insurance. After years of consideration, marked often by bitter controversy, in the House of Delegates, it was finally decided to organize a voluntary insurance plan, with medical service rather than money as our capital. When it came time to select a medical director for the infant California Physicians' Service, there seemed only one man qualified by experience and talents to fill the difficult position. To this task Morton Gibbons brought the same tact, sagacity and industry which he had demonstrated that he possessed in many former positions. And they paid off with success in a situation, which, to say the least, was an onerous one.

Being the man he was, it was not to be expected that Morton Gibbons could confine his public interests to medicine alone. He early became a member of, and later a force in, the Commonwealth Club. This writer first came to appreciate this remarkable man's capabilities twenty-five years ago, when serving as a member of a public health section committee of the club, of which Dr. Gibbons was chairman. From one position to another he advanced in this civic organization, until he was elected president for the biennium of 1949-50. He was thus preparing to enter the second year as helmsman of this organization when death called him from his duties.

Included in the host of California physicians who mourn his passing are his son, Dr. Morton R. Gibbons, Jr.; a brother, Dr. Henry W. Gibbons; and a nephew, Dr. Henry Gibbons, III.

Our profession is better for his having lived and served it, and his loss is well-nigh irreparable. To a man of impeccable integrity, hail and farewell.

J. Marion Read

* * *

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. T. Eric Reynolds was elected president of the Alameda County Medical Association, Dr. Dorothy M. Allen vice-president and Dr. Lester B. Lawrence secretary-treasurer in the November balloting of that organization. In addition, **seven delegates** to the California Medical Association were elected: Dr. K. W. Benson, Dr. John Blum, Dr. James Graeser, Dr. Ernest Henderson, Dr. Arthur Hunnicutt, Dr. Paul Michael, and Dr. James Raphael.

CONTRA COSTA

A committee of four physicians for the **Mt. Diablo Child Therapy Center,** now being organized, was named recently by Dr. George Husser, president of the Contra Costa County Medical Society. Dr. M. C. Bolender, chairman of the committee, said, following his appointment: "The county medical society committee approves the development of the Mt. Diablo Child Therapy Center provided it is approved and licensed by the State of California, and the medical profession of the community will willingly and voluntarily staff such an institution."

Other members of the committee are Dr. Howard B. Flanders, Dr. Saul S. Steinberg and Dr. Douglas Toffelmire.

LOS ANGELES

Dr. William E. Costolow was elected president and a trustee of the Los Angeles County Medical Association for 1950, it was announced last month following the reading of the report of the election committee. **Others elected** were: vice-president (1950), Dr. J. Philip Sampson; secretary-treasurer and trustee (1950), Dr. R. O. Bullis; trustee (five-year term), Dr. Ben Frees; councilorship, District No. 1 (three-year term), Dr. J. M. de los Reyes, Dr. Paul D. Foster, Dr. J. Norman O'Neill and Dr. John Edward Short; councilorship, District No. 2 (three-year term), Dr. Edward C. Rosenow, Jr.; councilorship, District No. 4 (three-year term), Dr. John R. Paxton.

* * *

The second annual mid-winter **radiological conference** sponsored by the Los Angeles Radiological Society will be held February 25 and 26 (Saturday and Sunday) at the Los Angeles Biltmore Hotel. Physicians other than radiologists are invited to attend. Fee for the two-day session is $15. In addition, there will be a charge of $5 for those wishing to attend a banquet which is to be held Saturday night. Reservations for the meeting and the banquet should be sent, with check, to Moris Horwitz, M.D., 441 North Camden Drive, Beverly Hills, California. Hotel reservations may be made by applying directly to the convention manager of the Biltmore Hotel.

PLACER-NEVADA-SIERRA

Dr. Carl Angella of Roseville has been elected president of the Placer-Nevada-Sierra County Medical Society. He succeeds Dr. C. Conrad Briner of Auburn. Dr. G. D. Tipton was elected vice-president, and Dr. Vernon Padgett secretary-treasurer.

SAN DIEGO

Dr. Arthur A. Marlow was elected president-elect of the San Diego County Medical Society at the annual meeting in November. He will take office as president in January, 1951, succeeding Dr. Clarence E. Rees, 1949 president-elect who was installed as president at the beginning of this year. Dr. W. H. Geistweit was elected secretary and Dr. M. D. Redding treasurer, both to serve this year.

SAN FRANCISCO

Election of **Dr. William L. Bender** to the presidency of the San Francisco County Medical Society was announced following count of ballots in December. Dr. Grace M. Talbot was elected first vice-president, Dr. Emile Torre second vice-president, Dr. Allen T. Hinman, secretary-treasurer, and Dr. J. Marion Read librarian.

SAN MATEO

Wilber L. Krell, administrator of Mills Memorial Hospital, was installed as president of the Association of Hospitals at the recent annual meeting of that organization in Santa Barbara.

* * *

Appointment of a **full-time executive secretary** and the opening of an office to conduct the business of the society were announced last month by the San Mateo County Medical Society. The executive secretary is Robert L. Wood, Jr., and the office is in Mills Memorial Hospital, 95 South El Camino Real, San Mateo. The San Mateo organization, with 171 members, thus becomes the ninth of 40 county medical associations in the state to employ the services of an executive secretary. Others are Alameda, Los Angeles, Fresno, Kern, San Diego, Orange, San Francisco and Santa Clara.

SANTA CLARA

Dr. W. Elwyn Turner, health officer of Santa Clara County, was elected president of the California State Conference of Local Health Officers at a meeting last November. Dr. J. B. Askew, San Diego County health officer, was elected vice-president, and Dr. Elmer M. Bingham, health officer of the San Joaquin Local Health District, was elected secretary. These officials serve as the executive committee of the conference during their term of office.

SANTA CRUZ

Dr. Daniel Smith of Watsonville has been elected president of the Santa Cruz County Medical Society, succeeding Dr. Allen Pederson of Santa Cruz. Dr. J. C. Jacobson was elected first vice-president and Dr. J. A. Ludden, Jr., second vice-president. Dr. S. B. Randall was reelected secretary-treasurer. Dr. Randall and Dr. Luther Newhall were elected to the House of Delegates of the California Medical Association.

POSTGRADUATE EDUCATION NOTICES

College of Medical Evangelists, Graduate School of Medicine

Courses in Internal Medicine, Dermatology, Functional Diseases in General Practice, Urology, Neurology, Proctology, Cardiology, Ophthalmology and Varicose Veins will be offered in January and March of 1950.

Contact: H. M. Walton, M.D., Dean, Graduate School of Medicine, College of Medical Evangelists, 312 North Boyle Avenue, Los Angeles 33, California.

University of Southern California, Medical Extension Education

Course: Gastroenterology.
Date: January 17, 1950, twelve weeks, part-time.
Fee: $50.00.
Place: Los Angeles County Hospital.

Course: Electrocardiography.
Date: January 20, 1950, twelve weeks, part-time.
Fee: $50.00.
Place: San Diego, California.

Course: Endocrinology.
Date: January 23, 1950, twelve weeks, part-time.
Fee: $50.00.
Place: Centinela Hospital, Inglewood.

Course: Clinical Electroencephalography.
Date: January, 1950, twelve weeks, part-time.
Fee: $50.00.
Place: Los Angeles County Hospital.

Course: Survey Course for General Practitioners.
Date: March 13, 1950, through March 17, 1950, five days, full-time.
Fee: $50.00.
Place: Los Angeles County Hospital.

Course: Electrodiagnosis and Electromyography.
Date: February 6, 1950, to February 18, 1950. Two weeks, full-time.
Fee: $100.00.
Place: Los Angeles County Hospital.

University of California, Medical Extension

Course: Applied Therapeutics.
Date: January 30 through February 1.

Course: Bone and Joint Surgery.
Date: January 30 through February 1.

Course: Special Problems in Pediatrics.
Date: February 6 through 10.

Course: Forensic Medicine.
Date: February 6 through 10.

Course: Internal Medicine and General Surgery.
Date: April 24 through 28.

Course: Psychiatry for the General Practitioner.
Date: April 24 through 28.

Contact: Stacy R. Mettier, M.D., Medical Extension, University of California Medical School, San Francisco 22, California. Fee schedule and printed program supplied on request.

GENERAL

The American Society for the Study of Sterility is offering an annual award of $1,000, known as the Ortho Award, for an essay on the result of some clinical or laboratory research pertinent to the field of sterility. Competition is open to those who are in clinical practice as well as to individuals whose work is restricted to research in basic fields or full-time teaching positions. The prize essay will appear on the program of the annual meeting of the American Society for the Study of Sterility, which is to be held at the Sir Francis Drake Hotel in San Francisco on June 24 and 25, 1950.

Full particulars may be obtained from the secretary, Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield, Massachusetts. Essays must be in his hands by April 1, 1950.

* * *

The annual meeting of the **American College of Allergists** will be held at the Hotel Jefferson, St. Louis, Mo., January 15-18, 1950.

* * *

Increases in **fees for physicians** who examine applicants for life insurance have been put into effect by seven life insurance companies in addition to those listed some time ago by the Bureau of Medical Economics Research, according to the *A.M.A. Secretary's Letter* dated November 11, 1949. The seven additional companies are Connecticut Mutual, Equitable Life Assurance, Fidelity Mutual, Manhattan Life, Home Life, Guardian, and New York Life.

As plans are being made for a cocktail party at El Cortez Hotel for members of the **Section on Eye, Ear, Nose and Throat** who attend the California Medical Association Annual Session in San Diego, April 30-May 3, officers of the section have asked that members arrange to stay at that hotel. Requests for room reservations at El Cortez may be had by addressing Elwood T. Bailey, general manager, Convention Bureau, Inc., 449 West Broadway, San Diego. Applicants should mention that they are members of the Section on Eye, Ear, Nose and Throat.

* * *

The Second Annual Scientific Assembly of the **American Academy of General Practice** will be held in St. Louis, Missouri, February 20 to 23, 1950. Official delegates from the California Chapter of the American Academy of General Practice will be Dr. L. C. Burwell, Los Angeles, and Dr. John G. Walsh, Sacramento. Dr. Walsh, as alternate, replaces the late William R. Harder, Los Gatos. Dr. Warren Austin, Santa Barbara, is an alternate delegate.

* * *

Advance registrations are being accepted from those who wish to attend the Fourth International **Congress of Obstetrics and Gynecology** to be held in New York May 11-14, according to announcement by Dr. Fred L. Adair, secretary of the National Federation of Obstetric-Gynecologic Societies. The registration fee is $10, and registration may be arranged by writing to Dr. Adair at 161 East Erie Street, Chicago, Illinois.

A regional **postgraduate seminar,** conducted by the California Medical Association Committee on Postgraduate Activities, was held December 10 at Redding. The 14 physicians who attended commended the meeting as practical and useful. The afternoon program was: Persistent Somatic Pain—Post Trauma Muscle Spasm and Trigger Points, by Charles O. Bechtol, M.D.; Surgical Aspects of Peripheral Vascular Diseases, by Dexter N. Richards, Jr., M.D.; High Points of Endocrinology, by Lloyd F. Hawkinson, M.D.; Dermatology in General Practice, by Raymond Allington, M.D. At the evening meeting, Antibiotics Since Streptomycin was discussed by Windsor Cutting, M.D.

A similar general program will be held for physicians in the **central San Joaquin Valley** counties at the Hughson Hotel in Modesto on Thursday, January 19. A heart symposium will be held in Merced on Friday, March 3.

The annual sale of **Easter Seals** to provide funds for rehabilitation of crippled children will be held March 9 to April 9, according to announcement of the California Society for Crippled Children.

* * *

A new insigne which physicians licensed to practice in California may attach to the license plates on their cars has been approved for use, according to recent announcement by the California Highway Patrol. It is to be used to provide exemption from provisions of the state speed law when a physician is answering an emergency call. Made in the form of a shield, the new streamlined metal insigne shows a gold caduceus on a blue background, with gold letters reading "California Licensed Physician."

~

BOOK REVIEWS

ZINSSER'S TEXTBOOK OF BACTERIOLOGY. Ninth Edition. Revised by David T. Smith, M.D., Donald S. Martin, M.D., Norman F. Conant, Ph.D., Joseph W. Blad, M.D., Grant Taylor, M.D., Henry I. Kohn, M.D., and Mary A. Poston, M.A. Appleton, Century, Crofts, Inc., New York, 1948. $10.00.

This well known textbook, first published in 1910, has appeared in its ninth edition. Under the guidance of Hans Zinsser, Phillip Hanson Hiss, and Stanhope Bayne-Jones, it established itself as one of the outstanding works in the field. Now it has been revised by a group of workers at Duke University headed by David T. Smith. Rewriting has been very extensive and on the whole is remarkably up to date. Material is presented in a manner which permits satisfactory clinical orientation on the part of the student but a minimum of consideration is given to the clinical features of infectious disease. This seems to the reviewer to be most satisfactory since textbooks and monographs must invariably be consulted for adequate descriptions of the nature of such disorders in any case.

The sections devoted to the nature of bacteria and host-parasite relationship are good, as are those describing the pathogenic bacteria. More unusual, in a one-volume text, are the excellent sections devoted to rickettsial and virus disease, and to the fungi. The interest of several of the authors in infection by the last group of agents is well known. A concluding section describes methods for the study of microorganisms and the isolation of such agents from patients. This material is presented very concisely and should be of considerable value to the medical student and physician. In the opinion of the reviewer this is the best one-volume textbook of bacteriology for medical students and physicians.

* * *

ATLAS OF OBSTETRIC TECHNIC. By Paul Titus, M.D., Obstetrician-Gynecologist to St. Margaret Memorial Hospital, Pittsburgh; Secretary, American Board of Obstetrics and Gynecology. Illustrations by E. M. Shackleford. Second Edition. The C. V. Mosby Company, St. Louis, Mo., 1949. $8.50.

As stated in the preface to the first edition, "This book undertakes to present in pictorial form (line drawings), with short titles, the subject of modern obstetric technique now accepted as standard for normal and operative deliveries, as well as for various complications of pregnancy and the puerperium. It includes also a section on the technique of sterility studies." Text is limited to a few brief comments at the beginning of each section, and to short supplementary descriptions of the procedures depicted. At the end of each section there are several blank pages so that one might record one's own observations and sketches. There are sections on pelvimetry, minor and major operations during pregnancy, abortion, ectopic pregnancy, cesarean section, induction of labor, and the usual vaginal procedures associated with obstetrics, such as normal delivery, forceps operations, version and extraction, breech extraction, destructive operations, packing of the uterus, etc.

The pictorial and written descriptions of the procedures chosen for consideration are adequate in most instances. The selection of procedures is somewhat arbitrary, however; often very popular operations are omitted. For example, the Latzko extraperitoneal cesarean section is not described, and in the section on sterilization operations, the Madlener, cornual resection, and Aldridge techniques are the only ones mentioned. In the section on forceps operations, the Barton forceps and their uses are not considered at all.

One is at somewhat of a loss to know to whom this book is addressed. Possibly it would be of value to hospital house officers and to men doing only a moderate amount of obstetrics along with their general work. For anyone who has had training in the specialty it is somewhat elementary.

* * *

THE EPIDEMIOLOGY OF HEMOLYTIC STREPTOCOCCUS, DURING WORLD WAR II IN THE UNITED STATES NAVY. By Alvin F. Coburn, M.D., the Rheumatic Fever Research Institute, Northwestern University Medical School, and Donald C. Young, M.D., Medical Director, Communicable Disease Service, Herman Kiefer Hospital. The Williams and Wilkins Company, Baltimore, 1949. $4.00.

Hemolytic streptococcus infection was a major problem to the armed forces of the United States in World War I. Principal interest was attached to the association of these organisms with influenzal pneumonia during the great pandemic. Numerous outbreaks, however, of scarlet fever were observed and, in areas where this situation prevailed, there was a striking increase in acute articular rheumatism. The association between streptococcal infection and joint disease was not appreciated, nor was it realized that the arthritic disorders were indeed rheumatic fever. Clinical, epidemiological, and bacteriological information was not obtained in regard to epidemic streptococcal infection of the respiratory tract during that war. The rapid mobilization of troops after the entry of the United States into World War II in 1941 was again accompanied by extensive outbreaks of hemolytic streptococcal respiratory infection. These were most severe in the northeastern area and in a belt running southward along both sides of the Rocky Mountains. Extensive investigation of these outbreaks was carried on by the Army Epidemiological Board, the Rheumatic Fever Control Program of the U. S. Army Air Force, and by the U. S. Navy. Dr. Coburn has summarized the magnitude of the streptococcal problem in the Navy during World War II and the results of investigation by epidemiological units. He has portrayed well the disastrous results of epidemic streptococcal infection and accompanying rheumatic fever.

A typical naval training station in a northern area is described as is the spread of streptococcal infection through it. Certain of the author's suggestions as to the mode of spread of these organisms through such a training station are speculative and not susceptible of proof at the present time. He later describes the introduction and failure of mass sulfonamide chemoprophylaxis, the development of resistant strains, and the spread of such resistant streptococci to a number of naval activities throughout the country. The last half of the book is devoted to a discussion of the role of contamination of extra-human reservoirs in the transmission of streptococcal disease and to certain information in regard to laboratory and other methods used by the epidemiological units. In his concluding chapters Dr. Coburn discusses measures to be used during a mobilization of troops at some future time to prevent the spread of streptococcal infection. It is disturbing to realize that, in spite of the detailed studies carried out by the Navy and by the other military groups, no new measures for the control of streptococcal infection have been devised. Dr. Coburn makes certain suggestions in regard to the construction of camps and better isolation methods but, in the opinion of the reviewer, the only improvement that may be made over the techniques available during the last war would be the elimination of training centers in the northern part of the United States. The records of all investigations show that streptococcal disease was not an important problem in the south and that rheumatic fever occurred less frequently in this area.

Dr. Coburn's book will not be of great interest to the practitioner but contains a wealth of information for the epidemiologist and others interested in infectious disease. It should also be required reading for all those responsible for the administration of medical services in the armed forces should mobilization of troops on a large scale again be necessary.

* * *

FUNDAMENTALS OF OTOLARYNGOLOGY, a Textbook of Ear, Nose and Throat Diseases. By Lawrence R. Boies, M.D., Clinical Professor of Otolaryngology, University of Minnesota Medical School, and Associates. W. B. Saunders Company, Philadelphia, 1949. $6.50.

The first few sentences of the preface read, "This book is the outgrowth of a plan for teaching the undergraduate medical student the fundamentals of otolaryngology. As a textbook it is not only designed to offer this basic instruction to the student but also to provide fundamental information to the physician who is not a specialist. It is not intended as a complete reference book." The authors have made a sincere effort to keep the volume within these stated limits and have achieved more than the expected success. They are to be commended for a product that is singularly free from recapitulation, rewriting or direct incorporation as a whole or in part of the many outmoded procedures, practices and theories that too often comprise up to one-third of the average text. This is refreshing. Whether or not the reviewer agrees with or employs implicitly or explicitly—and he does not—the theoretical expositions, method of diagnosis and proposed therapy, whether it be medical or surgical, would be beside the point were it not for the fact that such concord or disagreement acts as a baseline for the following criticisms and commendations. However, it is freely admitted that should every medical student and physician who is not a specialist have available and use intelligently the information available in this volume the otolaryngologic problems would be handled in a far more satisfactory manner than is the present custom.

The book is divided into three approximately equal sections: Part I, The Ear; Part II, The Nose; and Part III, The Throat. The section on the ear is good except for Chapter IX on Vertigo that seems somewhat involved for the novitiate and general practitioner. One has to read through several paragraphs to find that the direction of nystagmus is designated as being in accord with the quick component. The description of the internal workings and cost of the mechanical aids to hearing in Chapter X is interesting but not sufficiently detailed to permit discussion of the subject with the detail man, intelligent evaluation of the advertising claims or of real value to posterity.

Part II devoted to the nose is excellent in all respects. Chapter XV that deals with chronic nasal obstruction could be improved by at least mentioning several of the general conditions whose local manifestations produce nasal obstruction. The chapters devoted to the accessory nasal sinuses are adequate and present the modern attitude of conservation in diagnosis, therapy and surgery. Chapter XIX—Epistaxis—could be enlarged by at least 50 per cent and still not devote an unwarranted amount of space to this subject. This could be done at the expense of the following chapter on Atrophic Rhinitis.

Part III—The Throat—irritates one in the very first chapter (XXII) by referring the reader to subsequent chapters for details in regard to the nasopharynx and retropharynx. Chapter XXVII—Hoarseness—devotes most of its contents to paralyses and rather skims over the more common and more frequently encountered causes for hoarseness. Chapter XXX in discussing anesthesia for esophagoscopy states, "Local anesthesia for adults is quite satisfactory. The procedure is usually surprisingly comfortable for the patient." Before one swallows this statement one should try an esophagoscope. Chapter XXXII—Prescription and Therapeutic Procedures—offers ground for considerable differences of opinion. The reviewer is wholly opposed to the use of an all glass laryngeal syringe even in the hands of the expert. It frequently happens that the prescriptions are outmoded by the time the book comes off the press.

In summary it is an excellent textbook. It is well made, printed in good type on gloss paper and contains numerous clear though in some instances poorly selected illustrations. The table of contents is extensive and adequate. The index is satisfactory. It is recommended to not only the direct objectives—the medical student and the practitioner who is not a specialist—but to all otolaryngologists.

* * *

OPERATIONS OF GENERAL SURGERY. By Thomas G. Orr, M.D., Professor of Surgery, University of Kansas School of Medicine, Kansas City, Kansas. Second Edition. With 1700 Step-by-Step Illustrations on 721 Figures. W. B. Saunders Company, Philadelphia, 1949. $13.50.

The second edition of this book has numerous additions in each chapter. All of the newer developments in cardiovascular surgery have been added, and the techniques for esophagectomy and total gastrectomy are clearly described. A good balance between description and illustration has been obtained, so that it is quite easy to visualize the main technical points of each section. The author has selected the most acceptable methods of dealing with the common surgical problems, but he will find many who disagree with his statements about local excision of gastric ulcer. The volume has been devised for the beginner as well as the practicing general surgeon, and for both it will be found useful.

It should prove to be an excellent quick reference book for the busy surgeon.

* * *

MYCOSES AND PRACTICAL MYCOLOGY, A Handbook for Students and Practitioners. By N. Gohar, M.R.C.S. (Eng.), L.R.C.P. (Lond.). Assistant Professor, Parasitology and Mycology, Department of Clinical Pathology, Kasr El Ainy Faculty of Medicine, Fouad I University, Cairo, Egypt. The Williams and Wilkins Company, Baltimore, 1948. $6.00.

Increased interest in fungus disease has been reflected by the publication in recent years of several texts describing this group of infectious agents and the diseases caused by them. The present work, by an English author, is the least satisfactory of those that have come to the attention of the reviewer. The classifications used seemed needlessly complex. More than 20 species of pathogenic actinomycetes are described. For clinical purposes, segregation of these organisms into the anaerobic and the aerobic (nocardia) types is entirely adequate. The discussion of coccidioidomycosis is entirely inadequate and indicates that the author has not seen many of the studies published in this country in the last ten years. Histoplasmosis is mentioned but its possible association with nontuberculous calcification of the lung has been omitted. Ten pages have been devoted to a discussion of sprue, which the author admits is probably not a disorder resulting from infection of the gastrointestinal tract by monilia (Candida), and similarly, considerable space is devoted to fungus infections of the eyes, ears, and genitourinary tract. These are probably not of sufficient clinical importance to require such extensive treatment.

The last half of the book is devoted to a general discussion of fungus disease of the skin, which the reviewer did not feel qualified to discuss in detail. The etiological agents are segregated into a bewildering number of species, so many separate syndromes are described, and the suggested therapy is so obscure that it seems unlikely that any physician could manage patients adequately on the basis of the information contained herein. This book cannot be recommended.

* * *

A TEXTBOOK OF NEUROPATHOLOGY with Clinical, Anatomical and Technical Supplements. By Ben W. Lichtenstein, B.S., M.S., M.D., Associate Professor of Neurology, University of Illinois College of Medicine. Illustrated. W. B. Saunders Company, Philadelphia. 1949. $9.50.

This excellent volume is much more than a textbook of neuropathology. It is a clear, concise presentation of neurological syndromes from a pathological standpoint. The author states that it was primarily designed for medical students and those training in neurology, neuropsychiatry and neurosurgery, and in this he has more than surpassed his primary objective. For the teaching of neurology and neurosurgery, there are available many very comprehensive works pertaining to either field alone, but there is no other volume available which combines the important clinical and pathological aspects in such an understandable manner. To those beginning the study of neurology and neurosurgery, it should prove to be an indispensable text.

As a reference book for those more experienced in the treatment of diseases of the nervous system, the excellent bibliography at the end of each chapter should prove to be of great value. An added feature is the chapter termed Clinical Supplement in which definitions and brief descriptions of the many syndromes are presented. The chapter concerning neuropathological technique might prove to be of value purely as a reference but constitutes only a small portion of the textbook and is probably of much less general interest than the material in the remainder of the book.

The illustrations are of excellent technical calibre, well chosen, and add greatly to the value of a book which can be highly recommended to every individual interested in the treatment of diseases of the nervous system.

* * *

SYNOPSIS OF HERNIA. By Alfred H. Iason, M.D., Attending Physician, Adelphi Hospital, Director of Surgery, Brooklyn Hospital for the Aged. Grune and Stratton, New York, 1949. $6.50.

This book, as the author states in his preface, is a condensation of his previous book on hernia published in 1944. In so condensing his original book, Dr. Iason has eliminated many of its most interesting sections, namely those on the historical background, the theories of etiology, and the excellent discussion of the medicolegal aspects.

Surgeons operating on hernias would profit by familiarity with the original book. Medical students, and those general men doing occasional operations for hernia will find Dr. Iason's latest book exactly what its title describes it as being, a synopsis of hernia. It covers the various types of hernia, from common inguinal to rare pelvic in all their aspects, including anatomy, etiology, signs and symptoms, various types of surgical treatment thereof and finally an enlightening chapter on recurrences. It is clearly and concisely written and fairly well illustrated.

Those surgeons wishing to keep abreast of the latest developments in the anatomy and surgical technique of hernias will find that this book does not contribute anything significantly new to the subject and will profit more by reference to the many excellent papers in the recent literature.

* * *

A TEXTBOOK OF PHARMACOGNOSY. By George E. Trease, B.Pharm., F.R.I.C., F.L.S., Reader in Pharmacognosy and Head of the Department of Pharmacy in the University of Nottingham. Revised, Fifth Edition. The Williams and Wilkins Company, Baltimore, 1949. $8.00.

Pharmacognosy is the science having to do with the recognition of the nature and value of drugs, and more especially of drugs of plant origin. The subject matter includes the plant source, the gross and microscopic appearance of the medicinal portion of the plant and the chemical nature of its active principles. This book by George Edward Trease covers the subject as completely as is possible in a book of 800 pages, and is well illustrated with photographs and sketches of drugs plants and parts. The book is composed of five parts entitled General Principles, Drugs of Vegetable Origin, Drugs of Animal Origin, Chemistry, and Microscopy. Important chapters are on Commerce in Crude Drugs, with many illustrative photographs, Cultivation of Medicinal Plants, The Collection, Drying and Curing of Drugs, chapters describing the separate phyla of drug plants, Constitution of Drugs, Microscopical Study of Drugs and The Examination of Powdered Drugs. The book is of value not only to the pharmacist, but also to the physician who is interested in knowing the character of the materials going into the compounding of his prescription.

* * *

EARLY CARCINOMA OF THE UTERINE CERVIX—Pathogenesis and Detection (Revised and Augmented Edition). By Hansjakob Wespi, M.D., Chief of the Obstetrical and Gynecological Department, Frauenfeld Hospital, Aarau, Switzerland. Grune and Stratton, Inc., New York, 1949. $6.50.

This small volume is a translation by Marie Schiller of a monograph finished in 1943, first published abroad in 1946, and now revised by the addition of references to American papers of recent years, particularly those dealing with exfoliative cytology. The book is divided into four parts, the first being a foreword of 25 pages written by Walter Schiller and having very little to do with the rest of the volume. Parts two and three, comprising the bulk of the monograph, deal with colposcopy as employed by Wespi in nearly four thousand cases seen in the obstetrical and gynecological department at the University of Zurich. The histology of the normal and pathological cervical mucosa is presented and numerous case reports are given in detail. The concluding section discusses the development of carcinoma from various atypical varieties of epithelium and offers some rambling remarks on the origin of cancer. There is a bibliography of 235 items, followed by 95 figures, most of them good reproductions of photomicrographs of early carcinomatous lesions. Basically this monograph is a plea for the use of colposcopy in the diagnosis of early cervical carcinoma. It seems unlikely, however, that the colposcope—never popular with American gynecologists—will ever be widely used now that exfoliative cytology has become such a reliable diagnostic tool. Despite its belated appearance, this book contains many interesting observations, and it is recommended to all gynecologists and pathologists.

* * *

A DESCRIPTIVE ATLAS OF RADIOGRAPHS—An Aid to Modern Clinical Methods. By A. P. Bertwistle, M.D., Ch.B., F.R.C.S., Ed. Seventh edition, revised and enlarged. 980 illustrations. The C. V. Mosby Company, St. Louis, 1949. $16.00.

In the first chapter of this book entitled "Milestones in Radio-Diagnosis," an excellent historical summary is given of the important discoveries of x-ray methods of examination of various systems of the body. The remaining portion of the book consists of illustrations of radiographs which are accompanied by condensed descriptions and sometimes brief case histories. Much worthwhile material is thus presented, but the absence of an explanatory text makes the book somewhat fragmentary.

* * *

MALIGNANT DISEASE AND ITS TREATMENT BY RADIUM—Volume II. By Sir Stanford Cade, K.B.E., C.B., F.R.C.S., M.R.C.P., Surgeon, Westminster Hospital, Mount Vernon Hospital and Radium Institute. Second edition. The Williams and Wilkins Co., Baltimore, Md., 1949. $12.50.

Volume II of this series of three volumes deals with malignant disease of the mouth, pharynx, larynx, and neck

—anatomical areas in which radiotherapy has much to contribute in the treatment of patients. While the book is limited largely to the method of employment of interstitial radium therapy, this subject is covered well and with adequate diagrams showing appropriate dosages. X-ray therapy dosage is also given, and the choice of surgical operation or electrocoagulation as methods of treatment is discussed. The numerous illustrations, some of which are in color, add materially to the value of the book.

* * *

BLAKISTON'S NEW GOULD MEDICAL DICTIONARY. Harold W. Jones, M.D., Normand L. Hoerr, M.D., and Arthur Osol, Ph.D., Editors. 252 illustrations on 45 plates. First edition. The Blakiston Company, Philadelphia, 1949. $8.50.

This book is not a revision of Gould's Medical Dictionary, but, in the editors' words, a complete new reference work. It not only brings definitions of traditional medical terms abreast of current usage but also defines words recently brought into use in medical literature. Noteworthy is a definition of the word *allergy:* "Altered reaction capacity to a specific substance which will cause no symptoms of hypersensitivity in the nonsensitive." It is pleasant to note that by including the word *capacity* in the definition, the editors have held aloof from current (and rife) misusage.

A helpful feature is that trade names of medicinal products are included, always with notation that the name of the product is trademarked or proprietary.

The typography is such as to save time for the user. Words listed as sub-entries below the parent word are vertically aligned flush with a slightly indented left-hand margin. The eye need move only downward along the edge of the column to find the word being sought. This is a distinct improvement over the usual practice of scattering sub-entries like needles in a haystack of type below a main entry.

* * *

CLINICAL BIOCHEMISTRY. By Abraham Cantarow, M.D., Professor of Biochemistry, Jefferson Medical College, and Max Trumper, Ph.D., Commander, H(S), USNR, Lecturer in Clinical Biochemistry and Basic Science Coordinator, Naval Medical School, Bethesda, Maryland. Fourth edition. W. B. Saunders Company, Philadelphia, 1949. $8.00.

This is certainly one of the best texts on clinical biochemistry. It attempts to translate current biochemical knowledge into clinical practice and it succeeds remarkably well in this attempt. The coverage is broad, yet sufficiently detailed. The authors write from a wide personal experience. They also have an extensive bibliography for general subjects and specific statements at the end of each chapter; from these the reader may follow up any investigation he desires.

This, the fourth edition, has extensive revisions on acid-base balance; pigment metabolism in relation to jaundice; carbohydrate, lipid and protein metabolism; thyroid function; adrenal function; absorption and storage of iron; action of parathyroid hormone; renal physiology; vitamins and experimental diabetes. Newly added material includes chemical changes in shock; thymol turbidity and flocculation tests; fatty liver; the crush syndrome; alarm reaction; goitrogenic agents; and new methods of studying adrenocortical function.

The book is a valuable reference for both practitioners and students.

* * *

TEXTBOOK OF MEDICAL TREATMENT. By Various Authors, Edited by D. M. Dunlop, M.D., L. S. P. Davidson, M.D., and J. W. McNeew, M.D. Fifth edition. The Williams and Wilkins Company, Baltimore, 1949. $8.50.

This is the fifth edition in ten years of a standard British text of treatment. It has been written for both students and practitioners to provide a moderate sized text in which the information should be clear and explicit. However, there is much that may be criticized in the volume.

The arrangement of the chapters is unusual and without adequate reason as far as this reviewer can discover. The order begins: Infectious Diseases, Sulphonamide Drugs, Penicillin, Antihistaminic Drugs, Dehydration and Hypochloremia, Tuberculosis, Common Diseases of the Skin, Venereal Diseases, etc., etc.

The style itself of the book will probably limit its use largely to the countries in the sterling bloc. The idioms (particularly the medical idioms) will require translating for the average American student not brought up on weights in stone nor weighing in minims. The individual collaborators use either the metric or apothecary system as they choose. This breeds confusion—the avoidance of which is the avowed purpose of the editors. In the preface it is stated that the apothecary system has been used in deference to the practitioner but that an approximate metric equivalent has been included in brackets after each dose to encourage the use of the metric system. These equivalents are sometimes carried out to odd decimal points which will discourage even the most ardent proponent of this system.

In general the book is conservative in its outlook on newer methods. The treatment of diseases of the liver is incomplete and includes much which is outworn. The dosage of quinidine recommended for paroxysmal tachycardia is homeopathic. Aluminum hydroxide and magnesium oxide have failed. There is no discussion of antibiotics in the broad sense. The entire write-up on these substances is outdated; streptomycin is described as being in the experimental stage in tuberculosis; aureomycin does not appear; and penicillin is still in the every-four-hour dosage stage.

There is no bibliography at the ends of the chapters—an inclusion which would help the student. There are appendices, however, which include a conversion table for weights and measures and a list of official preparations with their proprietary equivalents. Forty pages are devoted to technical procedures.

This book can be recommended to American students and practitioners only for its comparative interest.

California MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION
© 1950, by the California Medical Association

VOL. 72 FEBRUARY 1950 No. 2

What's New in Pediatrics

Communicable Diseases

EVELYNNE G. KNOUF, M.D., *South Pasadena*

CHEMOTHERAPEUTIC AGENTS

EACH new chemotherapeutic agent which makes its appearance on the medical horizon is welcomed eagerly. It is used many times, unfortunately, with careless abandon. All are double-edged swords, healing when correctly used, jeopardizing when misused. Information regarding toxic manifestations is available only after careful observations honestly recorded.

Penicillin, now the elder brother of the antibiotics, is used so widely that it is wise to be reminded that this relatively harmless, non-toxic agent does produce untoward reactions. These may be immediate or Herxheimer-like with shock and death, or they may be delayed, causing discomfort to both patient and physician. Frequently, allergic reactions are observed, namely, urticaria, laryngeal edema, fever, dermatitis exfoliativa, neuritis, exacerbations of epidermophytosis and epidermophytids, and dermatitis venenata, when the drug is used topically.

Streptomycin is one of the antibiotics which early was considered to be comparatively innocuous. Time and use have decided otherwise. Many reports of toxic reactions are appearing in the literature. The most constant untoward manifestation recorded is temporary or permanent impairment of the function of the eighth nerve. Fever, dermatitis, eosinophilia, pruritus, conjunctivitis, and local irritation at the site of injection have been noted singly or in combination in the use of this agent.

In the communicable disease unit of the Los Angeles County Hospital it has been noted, on many occasions, that when streptomycin is given intrathecally (in tuberculous and influenzal meningitis) patients develop an immediate shock-like picture with cyanosis, rapid pulse, coma, opisthotonos, within a few minutes after administration. This has occurred sufficiently often to cause serious consideration of abandoning intraspinal use of streptomycin in influenzal meningitis.

Beham[2] and associates (New York) reported three cases of painful, erosive, membranous stomatitis involving the entire oral mucous membrane as well as the undersurface of the tongue. When the drug was discontinued the lesions disappeared in 14 days. Retreatment caused a rapid appearance of the lesions.

Hunnicutt[7] and associates reported a fatal case of toxic encephalitis caused by streptomycin. McCullough[13] and co-workers, in the treatment of brucellosis with the combined use of sulfadiazine and streptomycin, report two cases of severe encephalopathies. These occurred within a few hours after the first dose of streptomycin. They feel that the toxic effects on the nervous system have been frequent enough, when the two drugs are used in combination, to warrant considering the possibility that the combined use of the drugs increases both toxicity and clinical effectiveness. They recommend that such treatment be reserved for the seriously ill. (Toxic dermatitis develops in physicians and nurses handling this drug constantly.)

Aureomycin is one of the newer antibiotics derived from a strain of Streptomyces aureofaciens. It is a crystalline hydrochloride salt soluble in distilled water, less soluble in isotonic saline solutions. These

---

Head Physician, Communicable Disease Unit, Los Angeles County Hospital; Assistant Clinical Professor of Medicine, University of Southern California Medical School; Associate Clinical Professor of Medicine, College of Medical Evangelists.

Presented as part of a Panel Discussion on What's New in Pediatrics before the Section on Pediatrics at the 78th Annual Meeting of the California Medical Association, Los Angeles, May 8-11, 1949.

solutions are acid with a ph of 4.5. The drug deteriorates rapidly at room temperature in alkaline solution. It is bacteriostatic and bactericidal, the latter only in high concentrations. Herrell[5] at the Mayo Clinic has shown that aureomycin is readily absorbed in the general circulation. After a single oral dose of 0.75 gm. to 1 gm. the serum content of the drug rapidly approaches therapeutic levels. A constant level is maintained for several hours. There may not be complete disappearance from the serum for 24 to 30 hours. When 0.75 gm. to 1 gm. was given orally every six to eight hours, the serum concentration varied between 2 and 4 micrograms, or, on occasions, 8 micrograms per milliliter. These studies also showed that aureomycin diffuses into the spinal fluid in amounts that may be effective, into the pleural fluid, and through the placenta into the fetal circulation. It is excreted in large amounts in the urine and bile. Too, it is found in the kidneys, liver, lungs and spleen.

Aureomycin stands as a signpost pointing in three directions, giving promise of showing the way toward conquest of a large variety of Gram-positive and Gram-negative bacteria, the rickettsial diseases, and virus infections of the psittacosis-lymphogranuloma venereum group.

Aureomycin is usually given orally in doses of 50 mg. per kilogram of body weight per 24 hours, in divided doses given at intervals of two to six hours. To date the toxic effects have been minimal. Nausea, vomiting, and cystitis may occur due to the acidity of the drug.

Chloromycetin is obtained from cultures of the species Streptomyces venezuelae. Also, it can be prepared synthetically. It promises to be the most valuable therapeutic agent in the treatment of typhoid fever, typhus fever, scrub typhus, Rocky Mountain spotted fever, brucellosis, and bacillary urinary infections as well as in primary atypical pneumonia. It would appear to be relatively nontoxic to humans. High blood levels have been found within 30 minutes after oral administration, and appreciable amounts in the urine in the same period of time. The usual dosage is 50 to 60 mg. per kilogram of body weight initially and then 0.25 gm. every two to four hours.

Garlicin, a new antibiotic, is extracted from garlic. In a study made by Machado[12] and associates the drug was shown to inhibit growth of the colon bacteria. Its activity is enhanced by the sulfonamides. When taken orally it is found in the blood; it diffuses into spinal fluid and it is eliminated in bile and urine. It is found in the latter in two hours after administration. It is non-toxic even when given in doses up to 700 times the maximal therapeutic dose. In the treatment of 300 patients with enteric infections, it was found that those with Shigella infections showed improvement on the second day and bacteriological cure in six days. The average total dose was 332 units over the period of six days. In Salmonella infections, including paratyphoid, there was improvement on the second or third day and cure in nine days. The average dose for the latter period was 363 units. Stools of 31 out of 35 patients with amebiasis became and remained negative with an average total dose of 550 units over 10.3 days.

BAL—Furmanski[3] of Birmingham Veterans' Hospital made a most interesting report on the use of this drug in the treatment of four patients with peripheral neuritis of infectious origin. The BAL used was 10 per cent solution of 2, 3-dimercaptopropanol with 20 per cent benzyl benzoate and peanut oil as the vehicle. It was given by injection once daily for 9 to 22 days. The dose was 1.5 mg. to 3 mg. per kilogram of body weight per day. Response to treatment was rapid. The author postulates that the "mode of action in these cases may be similar to that of the heavy metal intoxications, i.e., conjugation of a toxin or toxic metabolite which had inactivated the enzyme systems. It is also possible that in the cases of infectious origin BAL inhibits one of the essential enzyme systems of the virus and aids the cell in overcoming the invasion."

ASPECTS OF TREATMENT OF SOME OF THE COMMUNICABLE DISEASES

Brucellosis, a disease which may be acute, subacute, or chronic, was one of the first infectious diseases for which Koch's postulates were established; yet it remains a therapeutic enigma to clinicians in spite of a vast array of chemotherapeutic agents available. Gradually, however, data are being assembled with respect to the relative merit of the individual drugs and antibiotics so that thinking may be clarified about its treatment in the near future.

Dr. A. G. Bower, for many years chief consultant for and chief of staff of the communicable disease unit of the Los Angeles County General Hospital, has had wide experience in treatment of brucellosis. He emphasizes that the proper, intelligent use of the sulfa drugs will effect cures that are permanent. In his own words: "When no contraindication exists, and when the patient has never been treated previously with any of the sulfonamide drugs, treatment with sulfonamides has never failed to effect a cure in our clinic. Conversely, when patients have been given sulfonamide drugs in doses insufficiently large to effect a cure at some time before we have seen them, in no single instance have we ever subsequently cured a case with these drugs. The secret lies in maintaining accurately titrated high blood levels of sulfadiazine or sulfanilamide constantly present for a period of two weeks. This is a hospital procedure. The level is maintained at 15 mg. per cent or higher, and in those patients not making progress after several days of continued observation, fluids are carefully restricted for a day or two to increase the sulfa-levels in the blood. The reason these drugs fell into disrepute in the treatment of this disease was because doses were inadequate, blood levels were not ascertained and controlled, the patients were not hospitalized, and the treatment was not continued long enough. If you are not successful in the first attempt, or if treatment has to be interdicted, it is useless ever to try it again."

Spink[17] and his associates in a report on 35 patients with brucellosis, nine of whom were treated with sulfadiazine and streptomycin, expressed the opinion that the combination was more effective than either agent used alone. Three of these nine patients had the chronic form of the disease, with manifestations of infection for three months or more. Spink recommended that streptomycin be given intramuscularly in doses of 0.5 gm. every six hours for seven days. Sulfadiazine should be initiated simultaneously with a dose of 4 gm. and then 1 gm. every four hours for at least two and preferably three weeks.

Herrell and Barber[6] of the Mayo Clinic recently reported that the combined use of aureomycin and dihydrostreptomycin appears to be the most effective method of treatment for brucellosis. Heilman of the department of bacteriology of the Mayo Clinic also found these drugs in combination to be the most effective method of treating Brucella infection in mice. Many combinations were tried—chloromycetin and sulfonamide, chloromycetin and aureomycin, chloromycetin and dihydrostreptomycin—as well as chloromycetin alone. None were as effective as aureomycin and dihydrostreptomycin. The recommendation for treatment is the administration of 3 gm. of aureomycin daily by mouth together with the simultaneous administration of 2 gm. of dihydrostreptomycin per day by the intramuscular route. In acute brucellosis the course of treatment should be 12 to 14 days. This method of treatment has the advantage of causing very little inconvenience to the patient. Also, possibility of toxic manifestations are minimized inasmuch as singly or together the two drugs, aureomycin and dihydrostreptomycin, are less toxic than when regular streptomycin alone or sulfadiazine alone, or the two in combination are used.

According to Parke, Davis and Company six patients with brucellosis, five of whom had positive blood culture, were successfully treated with chloromycetin with an average total dose of 17.5 gm. per patient. The average duration of fever was 2.4 days. On the basis of this it has been recommended that the patient with acute brucellosis be given an initial dose of 60 mg. per kilogram of body weight and 0.25 gm. every three hours thereafter for at least two and preferably three weeks.

Typhoid fever. Before the use of typhoid bacteriophage, more particularly type-specific phage, the treatment of this disease usually consisted of general supportive measures or occasionally immuno-transfusion. Typed phage has established itself as an effective mode of treatment of this entity.[10] In the recent past it has been responsible for lowering the mortality rate of 5 per cent in the communicable disease unit of the Los Angeles County General Hospital.

Since the advent of chemotherapy, each new drug and antibiotic has been used upon its appearance, in the treatment of typhoid fever with hopeful expectancy. All have failed except chloromycetin. From all indications, chloromycetin appears to produce the desired effect within a very short period of time, and with no toxic side-reactions.

Woodward, Smadel and associates[19] reported ten cases of typhoid fever treated with chloromycetin with cure in all, even in one patient with massive intestinal hemorrhage and in another with intestinal perforation. The drug was given orally with an initial dose of 50 mg. per kilogram of body weight and 0.25 gm. thereafter every two hours until the temperature was normal; this same dose was given every three to four hours during the first five days of normal temperature. Improvement was noted in 24 hours. The average duration of fever after treatment was started was 3.5 days. There were two relapses after 10 to 16 days without fever; however, in these cases the patients responded well to the second course of the drug, no lack of sensitivity to the drug having occurred.

During March of 1949, two children acutely ill with typhoid fever were treated with chloromycetin in the communicable disease unit. One patient, an 11-year-old girl, received 3 gm. daily by mouth for six days, and then 1 gm. daily for four more days. Within 36 hours after starting treatment there was clinical improvement and in 72 hours the temperature dropped by crisis from 103°F. to 96°F. The second child was one year of age. She received 3 gm. daily by mouth for three days and 1.5 gm. each day thereafter for four days. Clinical response was almost the same as in the first instance, but in this case the temperature was normal in 48 hours.

Typhus fever. During the summer of 1948 nineteen patients with murine typhus were treated with aureomycin in Mexico. Observations were made by a group of investigators from the University of Guadalajara and the New York Hospital-Cornell University Medical College. Response to treatment was spectacular and recovery uniformly occurred by crisis. The average duration of fever was 1.7 days after starting therapy regardless of the day of illness on which the treatment was begun. There were no relapses in spite of the fact that seven of the patients were treated for only one or two days. Convalescence was uneventful. From observation, the investigators felt that the "lowest full effective dose was somewhere between 50 and 100 mg. per kilogram per day for a short interval of therapy." All patients, with the exception of one, received the drug orally. One patient was given aureomycin intravenously in doses of 200 mg. at eight-hour intervals during the first 24 hours and then at 12-hour periods on the second day. Improvement was so rapid that when the last dose (fifth) was given, the patient was completely asymptomatic as well as afebrile. There were no evident toxic reactions.

In November and December of 1947, in the province of Camacho, Bolivia, during an epidemic, Payne, Knaudt, and Palacios[14] treated patients suffering from typhus fever with chloromycetin. Improvement was dramatic. One patient, 18 years of age, who on the third day of illness was extremely toxic and stuporous, was given 1.5 gm. of the drug by mouth once daily for two days. Fever and symptoms were gone on the second day. The patient was discharged on the fourth day. The investigators found that chloromycetin was safe for intravenous use when given in doses of 10 mg. per kilogram of body weight for three days. They found that headache and vision began to improve ten minutes after the intravenous injection was finished. Oral administration was just as effective; but then eight to twelve hours were required before results were evident.

Rocky Mountain spotted fever, an infectious disease caused by Rickettsia rickettsi and transmitted by the bite of ticks, first observed in the western section of the United States, now has been reported from every part of the country. It is a disease with acute fulminating symptoms, an incubation period of seven days, and is characterized by a hemorrhagic macular or confluent rash of the entire body. The mortality rate may vary between 10 and 50 per cent. Prior to para-aminobenzoic acid, with the exception of hyperimmune rabbit serum, the treatment was chiefly symptomatic and supportive.

Tichenor and co-workers[18] of Washington, D. C., reported eight patients treated with para-aminobenzoic acid with no deaths, as compared with a 10 per cent death rate in a control group. The dose schedule followed, in children, was 0.33 to 0.5 gm. per pound of body weight per 24 hours given at two-hour intervals; and, for adults, 6 gm. as an initial dose and 4 gm. at four-hour intervals. Treatment with the drug was continued for seven days, or, for approximately two to four days after temperature reached normal. There was a suggestion of liver dysfunction by changes produced by cephalin flocculation tests and prothrombin times.

Very encouraging results with aureomycin were reported by Ross and co-workers[16] in 13 cases treated since June, 1948, in Washington, D. C., and Baltimore. The maximum dose of the drug given was 5 mg. per kilogram of body weight at hourly and then two-hour intervals until the temperature reached normal, after which time it was given every four hours for a period of 48 hours. The average period of treatment was six days. There were no relapses and no toxic symptoms or signs. There were no deaths and the average hospital stay was eight days. Aureomycin is preferred to para-aminobenzoic acid because it is clinically more rapidly effective and because of absence of liver and kidney damage.

Pincoffs and associates[15] treated 15 patients with chloromycetin. Quite dramatically the temperature dropped to normal in 76 hours after the initial dose. Symptomatically there was some improvement in the first 24 hours with pronounced diminution of headache, etc., in 48 hours. It is recommended that the initial dose be 60 mg. per kilogram of body weight, then 0.25 gm. every three hours until the temperature remains normal for 48 hours.

Q fever is a disease caused by Coxiella burneti, closely related to the Rickettsia. It tends to occur endemically in the milkshed area of Los Angeles County. The disease usually has an abrupt onset either with rhinoconjunctivitis, or severe headache with retro-orbital pain followed by blood-tinged sputum, and chest pain. The leukocyte count may be normal or slightly elevated. Complement fixation tests usually do not show positive reaction until the third week.

During the past year in the communicable disease unit two patients who had this disease were treated with streptomycin and two with aureomycin. One 30-year-old male with history of illness of four or five months' duration received 2 gm. of streptomycin daily, or 0.5 gm. four times per day for six days. The temperature, which had varied between 103°F. and 104°F. dropped to normal on the fourth day. The patient remained symptom-free and afebrile thenceforth. Complement fixation was in dilution of 1:1,024. The second patient, a male 53 years of age, received streptomycin in doses of 2 gm. daily for five days. On the second day of treatment the generalized body pains and throbbing headache disappeared. The third patient, a man of 36 years, received aureomycin in doses of 500 mg. four times a day for six days. The temperature promptly dropped from 103°F. to normal, and clinical symptoms subsided in three days. The fourth patient with Q fever was a man 36 years of age who received 1,000 mg. of the drug four times a day for nine days. The temperature reached normal in three days and the patient was completely asymptomatic in 24 hours.

Tularemia stands out as one disease in which streptomycin is unequivocally indicated. The clinical effect is prompt and usually dramatic. Fever is down on or before the third day; the headache, malaise, mental depression are gone in 24 hours. Within 24 to 48 hours buboes decrease in size, and ulcers show signs of healing. In pneumonic tularemia, which previously carried a mortality rate of 20 to 40 per cent, the curative value of the drug is most spectacular. In severe primary atypical pneumonia, where tularemia may be etiologically suspected, a therapeutic trial with this drug may be life-saving. Inasmuch as streptomycin does not inhibit appearance of diagnostic agglutinins there would be no reason for withholding the drug.

Since the advent of streptomycin, three patients with tularemia have been treated with the drug in the communicable disease unit. One man, aged 37, with the ulceroglandular type, had been ill for one week before entry and the temperature spiked daily to 103°F. before streptomycin was given. The patient had a normal temperature and was clinically asymptomatic in 36 hours after starting treatment. He was given a total of 8 gm. in divided doses over a four-day period. The remaining two patients were husband and wife. Both gave history of chills, fever, and development of an ulcer on the hand four days after dressing wild rabbits. The man, aged 55, had the ulceroglandular type only. He was given 1.6 mg. of streptomycin over a four-day period. Temperature was normal eight hours after the first dose and there was pronounced evidence of healing of the ulcer with disappearance of the glandular enlargement on the fourth day. The wife, aged 63, had pneumonic involvement in addition to an ulcer on the right thumb. She was given a total of 2.2 gm. of streptomycin over a four-day period. The temperature dropped from 103°F. to normal in 24 hours. The pneumonia was gone and there was almost complete healing of the ulcer by the fourth day. The small doses used in these two cases were not a matter of choice but of necessity because of the difficulty in obtaining the drug at that time.

Actinomycosis involving the central nervous system is considered to be fatal in all cases. Thus, Jacobson and Cloward's[8] report of a case of actinomycosis meningitis with recovery is received with enthusiasm. This patient had signs of mental illness for 18 months before onset of acute signs of meningitis. The latter was diagnosed positively by the finding of Actinomyces in the spinal fluid. After two months of intensive treatment with penicillin, sulfadiazine, and streptomycin the patient was discharged from the hospital completely recovered from mental illness as well as the meningitis. There has been no evidence of relapse. Although all three drugs were used simultaneously, the patient first began to show signs of improvement when streptomycin was added. The latter was given intramuscularly and intrathecally, a total of 26 gm. in six days.

Arnold and Austin[1] in Hawaii reported cure of actinomycosis of the jaw with Diasone® (disodium formaldehyde sulfoxylate diamino-diphenylsulfone). The drug was given orally in accordance with the dose used by Dr. Fernando Latapi of Mexico City, who observed that the drug cured three patients. The dose used was that employed in Mexico in the treatment of leprosy: 1 gm. daily for the first week, 1.3 gm. (20 grains) daily for the second week and 1.6 gm. daily thereafter. By the end of the fourth week there remained only a residual fibrotic nodule less than one-sixth the size of the original mass.

Pertussis is one of the most serious of the acute contagious diseases of childhood and results in more deaths in children under two years of age than diphtheria, measles, scarlet fever and poliomyelitis combined. Early diagnosis, efficient nursing care and intelligent medical supervision, together with the use of the sulfa drugs, penicillin, and hyperimmune pertussis serum have helped diminish the deadliness of this scourge.

Because of its effectiveness against pertussis organisms in vitro, streptomycin was used in treatment by Gordon[4] and co-workers in a controlled series (27 treated and 28 controls) of cases. It should be noted that 23 of the 27 patients treated were under eight months of age. The dose of the drug was 25 mg. per pound of body weight per 24 hours. This daily total was divided by eight and given intramuscularly every three hours for an average of seven days. Some improvement was noted in 24 to 48 hours. Definite improvement occurred in three to four days. Mortality in the control group was 39.3 per cent as compared with 7.4 per cent in the treated group, but there was no significant improvement in the length of hospitalization when the two groups were compared.

The aerosol route of administering streptomycin is reported as most satisfactory by Leichenger and Schultz.[11] One gram of the drug was dissolved in 8 cc. of normal saline solution; 1 cc. of this was given every three hours. The solution was nebulized by attaching a Vaponefrin nebulizer to an oxygen tank, and administered via an infant-sized nasal mask (B.L.B.). The rate of flow of oxygen was 4 to 6 liters per minute and the average period of time to administer an aerosol dose of streptomycin was from 7 to 10 minutes.

In the communicable disease unit the triple use of hyperimmune pertussis serum (Cutter's Hypertussis), sulfamerazine and sulfadiazine in combination, and penicillin, has proved efficient, and streptomycin has been reserved for patients who are not making the usual satisfactory response. During 1946 the mortality rate was 3.7 per cent and in 1947 to 1948 it was 2.8 per cent, or an average of 3.2 per cent for the two-year period. This is an excellent death rate considering that about 80 per cent of the patients were under two years of age and over 50 per cent had complications on entry.

To cure a disease is praiseworthy; to prevent it is a finer accomplishment. There is no longer any valid excuse for postponing immunization for pertussis. It can be instituted on the first day of life, if desired. Certainly it should not be delayed beyond the third or fourth month. Because of studies made and others in process more doctors are giving not only pertussis immunization but combined immunizations at earlier ages than the time-honored six months. For the past three years it has been the practice of the author routinely to commence immunization with the combined antigens (alum precipitated diphtheria, pertussis and tetanus toxoid) at three months of age, giving three injections at four to six-week intervals and following with a booster injection within six to nine months. Amazingly few reactions are encountered.

REFERENCES

1. Arnold H. L., Austin, E. R.: J.A.M.A., 138:955, Nov. 27, 1948.

2. Beham, H., Perr, H.: J.A.M.A., 138:495-496, Oct. 16, 1948.

3. Furmanski, A. R.: Archives of Neurology and Psychiatry, 60:270-278, September 1948.

4. Gordon, V. H., Almaden, P. J.: Journal of Pediatrics, 34:279, March 1949.

5. Herrell, W. E., Heilman, F. R.: Proceedings of the Mayo Clinic, March 30, 1949.

6. Herrell, W. E., Barber, T. E.: Proceedings of the Mayo Clinic, March 16, 1949.

7. Hunnicutt, T., Graf, W. J., Hamburger, M., Ferris, E. B., Scheinker, I. M.: J.A.M.A., 137:599-602, June 12, 1948.

8. Jacobson, J. R., Cloward, R. B.: J.A.M.A., 137:769, June 26, 1948.

9. Knight, V., Ruiz-Sanchez, F., Ruiz-Sanchez, A., McDermott, W.: American Journal of Medicine, 6:407-416, April 1949.

10. Knouf, E. G., Ward, W. E., Reichle, P. A., Bower, A. G., Hamilton, P. M.: J.A.M.A., 132:134-137, Sept. 21, 1946.

11. Leichenger, H., Schultz, A.: Journal of Pediatrics, 33: 552, November 1948.

12. Machado, P. De A., Duran, M., Cross, J. D., dos Santos, D. C.: An. paulist. de med. e cir., 55:99-115, February 1948. Yr. Bk. of Gen'l Ther., Oscar W. Bethea, p. 134.

13. McCullough, M. B., Eisele, C. W.: J.A.M.A., 139:80-82, Jan 8, 1949.

14. Payne, E. H., Knaudt, J. A., Palacios, S.: Journal of Trop. Med., 51:68-71, April 1948.

15. Pincoffs, M. D., Guy, E. G., Lister, L. M., Woodward, T. E., Smadel, J. E.: Ann. Intern. Med., 29:656, 1948.

16. Ross, S., Schoenbach, E. B., Burke, F. G., Bryer, M. D., Rice, E. C., Washington, J. A.: J.A.M.A., 138:1213, December 1948.

17. Spink, W. W., Hall, W. H., Shaffer, J. M., Braude, A. I.: J.A.M.A., 136:382-387, Feb. 7, 1948.

18. Tichenor, C. J., Ross, S., Preston, A.: Journal of Pediatrics, 31:1-22, July 1947.

19. Woodward, T. E., Smadel, J. E., Ley, H. L., Green, R., Mankikar, D. S.: Ann. Int. Med., 29:131-134, July 1948.

* * *

All That Queries is Not Queensland

As a mother with a defective child, many writers on medical subjects appear determined to bring to maturity the erroneous assumption that the "Q" in *Q fever* indicates the place in which the disease entity was first noted—Queensland, Australia. Indeed, so plausible is the error that glib reference to "Q (for Queensland) fever" persists in medical writing despite sound evidence that, had it not been for accidental geographic-pathologic coincidence, the"Q" might (confoundingly) have stood for, say, New South Wales.

Lennette made some effort to right the wrong in an article titled "Q Fever in California" which appeared in the August 1948 issue of CALIFORNIA MEDICINE. In a footnote to that article, Lennette said that he had had from Derrick, who first described the features of the disease as it appeared in Queensland, a personal communication to the effect that "Q" was not for Queensland but for "query" because of uncertainty as to identification. Queensland, it seems, was implicated merely because it was known to have been at the scene of the investigation.

It is to be hoped that, with this further admonition, medical writers will mend their ways p.d.q. (for quickly).

What's New in Pediatrics

Rheumatic Fever

ROBERT G. SHIRLEY, M.D., *Beverly Hills*

THE seriousness of the rheumatic fever problem has at long last been recognized. Public-spirited organizations and the medical profession have joined hands in a concerted effort to procure funds for research and for the dissemination of the knowledge already accumulated on the symptomatology, diagnosis and treatment of rheumatic fever. In 1948 there were 22 state and 22 private rheumatic fever programs.

Angove[1] reported that rheumatic fever kills more than five times as many persons annually as poliomyelitis, pertussis, diphtheria, scarlet fever, measles and meningitis combined. For every case of poliomyelitis in the age group 5 to 15 years there are 111 cases of rheumatic fever, and for every death from poliomyelitis there are 154 deaths from rheumatic fever.

Martin[10] has estimated that each year 40,000 persons die from rheumatic fever and its sequelae in the United States, and that between 800,000 and 1,000,000 new cases develop annually. Rheumatic fever ranks first as a cause of death for girls in New York City and is second only to accidents for boys.

Meakins[12] found the disease seven times more common in urban than in rural school populations. The disease is about 20 times more common in the working class than among the wealthy. There is a pronounced seasonal variation coinciding with the prevalence of hemolytic streptococcus infections. At one time it was felt that rheumatic fever was a disease of the temperate zone. We now know it has a universal distribution, but occurs less commonly and is generally less virulent in subtropical and tropical areas where streptococcal infections are not as prevalent. Clark[3] observed no cases of mitral stenosis during 30 years in the tropics. He found 747 cases of joint involvement and other manifestations, obviously rheumatic, but no rheumatic heart disease. These data were gathered from observation of 571,526 clinic outpatients drawn from an estimated population of 33,748,369.

Coburn and Moore[4] have expressed the opinion that there are three factors in the genesis of the rheumatic state:

1. A constitutional factor transmitted as a single autosomal recessive gene—a conclusion reached by Wilson and Schweitzer[22] based on the quantitative agreement between the observed incidence and the value predicted from this hypothesis. The presence of this recessive gene alters the host in some manner as yet unknown, to make him constitutionally susceptible. It has been estimated that about 5 per cent of the population are so affected. The onset of rheumatic fever in this susceptible 5 per cent of the population depends on the two other factors, namely:

2. Infection with the hemolytic streptococcus, whose products precipitate the rheumatic attack, and

3. Deficiency in the host of certain dietary factors.

Cavelte[2] has recently carried out some interesting experimental studies supporting the generally accepted belief that the rheumatic process is initiated by the hemolytic streptococcus. He found that nonantigenic emulsions of homologous heart muscle and connective tissue can be rendered antigenic for rabbits by combining them with heat-killed hemolytic streptococci. Such a mixture when injected into rabbits produced valvular endocarditis with inflammatory infiltration and proliferation. Mixtures of skeletal muscle, free from connective tissue, and hemolytic streptococci did not produce cardiac lesions. Cavelte found antibodies to human heart in titers of 1:40 to 1:320 in 47 out of 67 samples tested from patients with rheumatic heart disease. On the basis of these studies Kerr[9] suggested that the hemolytic streptococci or their products, in conjunction with the connective tissues of the body, produce auto-antibodies which are the cause of the lesions associated with the rheumatic state. Previously, Rich and Gregory[15] produced lesions in laboratory animals similar to those of rheumatic carditis by inducing anaphylactic hypersensitivity to sulfonamides. They later produced widespread vascular lesions similar to rheumatic arteritis, lupus erythematosus and periarteritis nodosa by anaphylactic hypersensitivity. These studies are additional evidence supporting the role of the factor of hypersensitivity in rheumatic fever.

The importance of the diet in the pathogenesis of rheumatic fever is not clearly understood. Coburn and Moore[4] found that children with recrudescences were lacking in proteins, iron, vitamin A and possibly calcium and riboflavin.

Jackson and co-workers,[8] from a study of rheumatic subjects receiving supervised diets and environmental care, concluded that if the disease is definitely inactive, adequate diet and good care will practically eliminate the chances of recurrence with

---

Presented as part of a Panel Discussion on What's New in Pediatrics before the Section on Pediatrics at the 78th Annual Meeting of the California Medical Association, May 8-11, 1949, Los Angeles.

carditis. They found that the degree of deficiency of the diet was related to the incidence and degree of cardiac damage.

Van Breeman, cited by Coburn and Moore,[4] reported that in the Netherlands there were only 228 deaths from rheumatic fever between the years 1920 and 1925. In the industrial cities of England it was a very important cause of death. The climate, race, age and incidence of respiratory infections were about the same in the two countries. The major difference was in the diet, the people of the Netherlands receiving abundant amounts of dairy products. The role of the diet is difficult to evaluate, however, as the increased incidence of rheumatic fever in the group on an inadequate diet may be due to an increased susceptibility to infections.

Griffith[6] has divided the rheumatic cycle into four phases:

1. The phase during which the patient is host to the hemolytic streptococcus. Swift[18] is of the opinions that if all cases of rheumatic fever could be studied bacteriologically and immunologically for the presence of antibodies against streptococcal components, practically all would be shown to have a "Phase 1" prior to the attack of rheumatic fever. The site of the infection is generally believed to be in the upper respiratory tract and the offending substance is probably produced locally.

2. The latent phase which lasts from one to four weeks. This is one of the most characteristic features of this disease. It is during this period that the immunologic reactions are becoming established.

3. The period of rheumatic activity during which the classical symptoms of rheumatic fever occur, and

4. The period of rheumatic inactivity. The fourth period may be the end to the rheumatic process or may be followed by one or more recurrences.

Much emphasis has been put on the major and minor criteria of rheumatic fever in recent years. Although there have been minor differences of opinion, the consensus is that carditis, subcutaneous nodules, erythema marginatum, polyarthritis, chorea and a history of a preceding attack are the major criteria. Fever, abdominal pain, precordial pain, non-traumatic epistaxis, weight loss, tachycardia and pneumonitis are listed as the important minor criteria.

Such a division of symptoms is of value in bringing to mind the important features of the disease. It is not without danger, however, to dictate strict standards of diagnosis which depend on a specific number of major and minor criteria being present. The ability to evaluate the material at hand comes only after years of intimate contact with rheumatic patients. One need only to make rounds on any rheumatic fever service or attend any cardiac clinic to realize, from the differences of opinion expressed by those who helped formulate the criteria, that such a punch-board method will never work in the diagnosis of rheumatic fever any more than it has worked in the diagnosis of any other disease. The major and minor criteria are aids in diagnosis, nothing more.

The electrocardiogram, erythrocyte sedimentation rate and x-ray remain the chief laboratory procedures used in the appraisal of the child suspected of having rheumatic fever and in directing therapy during the period of activity. The most frequent changes in the electrocardiogram are an increase in the PR interval, changes in the QRST or ventricular portion of the electrocardiogram, and disturbances of rhythm. Frequently repeated electrocardiograms are important in the proper evaluation of any deviation from normal. A change in the electrocardiogram during the period of observation is more important in indicating rheumatic activity than the existence of any specific variation from the accepted normal.

Recently Taran[19, 20, 21] has emphasized the importance of the Q-T quotient as an indication of rheumatic activity. The Q-T interval is the duration of electrical systole, and its use as an indication of cardiac function is based on the physiological principle that a disturbance in the time relationship of systole and diastole is a manifestation of impairment of the functional integrity of the myocardium. When electrical systole is prolonged the diastolic period or perfusion time of the heart muscle is shortened. This results in local tissue anoxia and ultimate heart failure.

The erythrocyte sedimentation rate should be used with caution in the diagnosis of rheumatic fever. There is a tendency to attribute undue importance to this laboratory procedure. It should be evaluated in the light of the history, physical findings and other laboratory data. It is more useful and more reliable as a guide in the management of the rheumatic patient, but even here it is sometimes misleading in either direction.

An x-ray of the chest for heart size is valuable as a base line for future comparison. Schwedel[17] has expressed the belief that progressive cardiac enlargement or the enlargement of an individual cardiac chamber as compared to a previous film is an indication of rheumatic activity. The chambers most commonly enlarged are the left auricle and the right auricle and ventricle. Pulmonary complications and pancarditis are not uncommonly encountered and roentgen study then is needed for confirmation of the clinical impression. It must again be emphasized that this is just another aid in the diagnosis and treatment and should not in any way supplant a careful history, detailed physical examination and the other laboratory procedures of value in the appraisal of the child with rheumatic fever.

MANAGEMENT

Bed rest continues to be the cornerstone in the management of the child with rheumatic fever. It is unfair to follow any set rule for the period of complete bed rest. Each case should be judged individually. But bed rest should by all means be continued until all signs of activity as manifested by fever, sleeping pulse rate, electrocardiogram and sedimentation rate have returned to normal and the child is again alert, interested in his environment and gaining in weight. At that time a very gradual return to normal activity, under close supervision, should be instituted.

Coburn[5] and Taran[20, 21] have expressed the belief that massive doses of salicylates given early in the exudative phase change the course of the disease. This view has not been generally accepted. Murphy,[13] in a histological study of the exudative lesions in patients with acute rheumatic fever receiving large doses of salicylates, found no evidence to support the contention that salicylates exert a specific effect on the underlying disease process. The value of salicylates in the symptomatic therapy of the exudative phase is universally recognized. Salicylate therapy should be discontinued for at least two weeks, with a reevaluation of the patient at the end of that time, before any other changes in therapy are made, for salicylates not only suppress the acute symptoms but alter laboratory findings.

The controversy over the use of digitalis continues. Pediatric cardiologists are extremely cautious in use of the drug. The toxic and the therapeutic dose are very close, and Taran[21] has expressed the belief that, in active rheumatic fever, the toxic dose is less than the therapeutic dose. The drug may be of some value as a last resort in the patient with right-sided heart failure, but the results are not encouraging. The digitalizing dose is 100 mg. per 10 pounds of body weight, given in divided doses at intervals of six hours. The maintenance dose is 10 mg. per 10 pounds.

The dose of the more rapidly acting digitoxin is 0.1 mg. per 10 pounds of body weight, with a maintenance dose of 0.01 mg. per 10 pounds. Digifolin® is given intramuscularly in a digitalizing dose of 20 to 60 mg. per 10 pounds of body weight, with a maintenance dose of 2 to 6 mg. per 10 pounds.

The mercurial diuretics have been recommended by Taran[20, 21] for the treatment of congestive heart failure. The diuretic is given until a dry or stabilized weight is obtained, at which time the patient is put on a maintenance dose. This may be continued for months or years.

The use of continuous oxygen to promote cardiac rest and to reestablish the normal relation between systole and diastole has been urged by Taran.[20, 21] This increases cardiac output and improves the general condition and well-being of the patient.

The indications for tonsillectomy for the child with rheumatic fever are no different than for the non-rheumatic child. If the tonsils are unduly large or diseased and the child is subject to recurrent otitis media, cervical adenitis and nasal obstruction, the tonsils and adenoids should be removed. The operation should not be performed, however, until all signs of rheumatic activity have disappeared, since recrudescences may result from operation while the disease is active. Carious teeth or abscessed roots may be foci of infections and contribute to the continuation of the active phase of the disease. All infected teeth should be repaired during the inactive phase.

When any surgical or other procedures which might possibly spread a localized infection are contemplated a sulfonamide drug or penicillin should be given prophylactically preoperatively and for a week postoperatively.

SULFONAMIDES

The value of the sulfonamides in preventing recurrences of rheumatic fever has been amply demonstrated and reviewed by Hansen.[7] It has been estimated that a child who is receiving a sulfonamide continuously is only one-tenth as liable to have recurrence as the child who is not. The dose is 1.0 gm. of sulfadiazine or sulfamerazine a day, and it should be continued for a minimum of five years, but preferably through puberty regardless of length of time. The patient should be examined for signs of intoxication at weekly intervals for the first six weeks and at six-week intervals thereafter.

Massell and co-workers[11] in a study of oral administration of penicillin in patients with rheumatic fever found that 100,000 to 200,000 units of penicillin three times a day completely eradicated hemolytic streptococci from the throats of 75 per cent. Even in those patients in whom the organisms were not completely eradicated, they were greatly suppressed so that streptococci were not shown on cultures during the period penicillin was administered. The authors felt that this indirect evidence indicated penicillin might be practicable for the prevention of hemolytic streptococci and hence for rheumatic fever prophylaxis.

Prompt sulfonamide therapy of streptococcic infections among rheumatic susceptible patients will not prevent rheumatic recurrences. Rantz and coworkers[14] expressed the belief that prompt penicillin therapy of streptococcal infections interferes with the immune response by eliminating streptococci from the throat before toxins can be produced and disseminated in an appreciable quantity. It may be possible by prompt penicillin therapy of the streptococcal infection to prevent the chain of events which result in the rheumatic state.

416 North Bedford Drive.

REFERENCES

1. Angove, P. C.: Michigan's rheumatic fever program, J. Michigan M. Soc., 47:281, 1948.

2. Cavelte, P. A.: Autoantibodies in rheumatic fever, Proc. Soc. Exper. Biol. and Med., 60:379-381, Dec. 1945.

3. Clark, J. T.: The geographical distribution of rheumatic fever, J. Trop. Med., 33:249, Sept. 1930.

4. Coburn, A. F., and Moore, L. V.: Nutrition as a conditioning factor in the rheumatic state, Am. Jour. Dis. Child, 65:744, May 1943.

5. Coburn, A. F.: Salicylate therapy in rheumatic fever, Bull. Johns Hopkins Hosp., 73:435-464, 1943.

6. Griffith, G. C.: Rheumatic fever; its recognition, California and West. Med., 63:119, 1945.

7. Hansen, Arild E.: Rheumatic recrudescences: diagnosis and prevention, J. Pediat., 28:296, 1946.

8. Jackson, R. L., Kelly, H. G., Rohret, C. J., and Duane, J. M.: Rheumatic fever recurrences in children without sulfonamide prophylaxis: evaluation of environmental factors, J. Pediat., 31:390-402, Oct. 1947.

9. Kerr, W. J.: Pathogenesis of rheumatic fever, Annals of Int. Med., 29:587, Oct. 1948.

10. Martin, A. T.: Rheumatic fever and the American Academy of Pediatrics—general purpose and scope, J. Pediat., 26:209-210, March 1945.

11. Massell, B. F., Dow, J. W., and Jones, T. D.: Orally administered penicillin in patients with rheumatic fever, J.A.M.A., 138:1030, Dec. 4, 1948.

12. Meakins, J. C.: Rheumatic fever, Canadian M.A.J., 39:426-429, Nov. 1938.

13. Murphy, G. E.: Salicylate and rheumatic activity, Bull. Johns Hopkins Hosp., 72:1-42, July 1948.

14. Rantz, L. A., Boisvert, P. J., and Spink, W. W.: Hemolytic streptococcal sore throat, antibody response following treatment with penicillin, sulfadiazine and salicylates, Science, 102:352-353, March 22, 1946.

15. Rich, A. R., and Gregory, J. E.: Experimental evidence that lesions with the basic characteristics of rheumatic carditis can result from anaphylactic hypersensitivity, Bull. Johns Hopkins Hosp., 73:239, 1943.

16. Rich, A. R., and Gregory, J. E.: Further experimental cardiac lesions of the rheumatic type produced by anaphylactic hypersensitivity, Bull. Johns Hopkins Hosp., 75:115, 1944.

17. Schwedel, J. B.: Diagnostic value of roentgenography and fluoroscopy in the diagnosis of rheumatic heart disease, Am. J. Med., 2:517, 1947.

18. Swift, H. F.: The relationship of streptococcal infections to rheumatic fever, Am. J. Med., 2:168-189, Feb. 1947.

19. Taran, L. M., and Szilagyi, N.: Duration of electrical systole (Q-T) in acute rheumatic carditis in children, Am. Heart J., 33:14-26, Jan. 1947.

20. Taran, L. M.: The treatment of acute rheumatic fever and acute rheumatic heart disease in children, M. Clin. North America, p. 557, May 1947.

21. Taran, L. M.: Lecture delivered before a joint meeting of the Los Angeles Heart Association and the Pediatric Section of the Los Angeles County Medical Association, 1949.

22. Wilson, M. G., and Schweitzer, M. D.: Rheumatic fever as familial disease. Environment, communicability and heredity in their relation to observed familial incidence of disease, Jour. Clin. Investigation, 16-555, 1937.

* * *

What's New in Pediatrics

Treatment of Erythroblastosis

Clement J. Molony, M.D., *Beverly Hills*

After two years of trial of substitution transfusion of blood in the treatment of erythroblastosis, this method now can be better evaluated and earlier concepts revised. This presentation, then, will be concerned with the total experiences in Southern California with substitution transfusion, as well as with the mistakes that have been made and with suggestions for the safe and proper use of the procedure.

The substitution or exsanguination transfusion was originally developed in eastern centers in 1946 and 1947 and the first reports were glowing, as they usually are. In Southern California the first such transfusions were done in April 1947, and the poor results were alarming and confusing. There was at hand no set of indications for the procedure; mistakes were made and babies continued to die in spite of this new means of therapy.

For purposes of assay and appraisal, therefore, and to study the community effort rather than that of a specialized hematological center, records of all the cases of erythroblastosis in which substitution transfusion was used in a two-year period ending in April 1949 were gathered together. Comparisons between experience at Children's Hospital, Los Angeles, and that at other Southern California hospitals were made. For comparative purposes, data were gathered also on cases of erythroblastosis in which substitution transfusion had not been used.

Table 1 lists the data, which seem to indicate that substitution transfusion has not lowered the mortality rate in Southern California; in fact, it seems to have raised it. However, most of the cases in which substitution was used were severe, whereas most of those handled conservatively were mild.

In addition, the number of cases of cerebral damage that came to light was most alarming. About 15 per cent of the patients who lived turned out to be abnormal, either athetoid or simply slow in mental development. Similar experience has been reported in the literature. The cause of this brain damage is still unknown. Often the condition occurred in cases which were clinically mild. Most students of the disease feel that the damage takes place in utero and that no procedure will alter the development of this complication. It is interesting that these cases tended to be associated with very high maternal antibody titre. Weiner's original thought that kernicterus was produced by the blocking antibodies and that hemolytic symptoms were produced by agglutinins is no longer tenable because agreement now is general that blocking antibodies are the only cause of all forms of hemolytic disease of the newborn.

Table 1.—*Mortality Rates from Erythroblastosis in Southern California*

	Number of Cases	Deaths	%
Cases in which substitution was used	45	13	29
Children's Hospital	16	4	25
Other hospitals	29	9	31
Cases in which substitution was not used: Children's Hospital	35	5	14
	—	—	—
Total Children's Hospital experience	51	9	18

Other positive and interesting findings included:

1. The history of a preceding sibling with erythroblastosis did not carry a particularly bad prognosis. This is contrary to the thought of Potter and others.
2. Erythroblastosis occurs most commonly in the second pregnancy.
3. Prenatal antibody titres had a definite correlation with the severity of the disease. However, the author disagrees with many of the workers in the field who state that a very high maternal titre invariably means a serious case with a high death rate. In ten cases in this series the titre was 1:256 or more, yet the patients lived and are well, half of them without having had substitution transfusion.
4. Substitution transfusions definitely cut down the length of hospital stay and the number of subsequent transfusions needed.

One relatively unpublicized procedure which has been most helpful has been the Coombs test, sometimes known as the developing test or the antiglobulin test. With this procedure used on the baby's cord blood it is possible to determine the presence of sensitized cells and the titre of any free maternal antibody, and thus get an idea of the probable severity of the disease—all before the baby may show any clinical evidence of erythroblastosis. Obviously such information is of value in determining whether or not to use substitution transfusion. Sturgeon, in a recent report on the use of the Coombs test, noted that the strength of reaction to the test was in close correlation with the severity of the disease, an observation which has been borne out in the author's

---

From the Medical Service of the Los Angeles Children's Hospital.

Presented as Part of a Panel Discussion on What's New in Pediatrics before the Section on Pediatrics at the 78th Annual Meeting of the California Medical Association, May 8-11, 1949, Los Angeles.

Table 2.—*Coombs Test Reaction Correlated with Severity of Disease*

	No. Cases	Average Severity (8.0 max.)	Died	Kernicterus
Strong reaction	16	Severe (5.6)	5	0
Moderate reaction	23	Mod. (3.7)	2	2
Weak reaction	17	Weak (2.5)	0	1

experience (Table 2). Thus it is indicated that substitution transfusion should not be considered if the Coombs test reaction is weak.

In passing, the use of Rh hapten for treatment should be mentioned. This is an extract of Rh positive blood which was developed by Carter. It is lipid in nature and non-antigenic; it is said to specifically inhibit anti-Rh agglutinins and appears to be a hapten. The material was used throughout pregnancy in one very severe case and, in this instance, was of no value. The baby, which was born prematurely at seven and one-half months, was hydropic and died a few minutes after birth. Sturgeon and Strong worked with this hapten serum two years ago and could not duplicate the results reported from the original work. Further work along the line of producing a neutralizing serum to be given the mother during pregnancy is certainly indicated.

Although many errors in technique have been made in use of substitution transfusion, the author feels that this "growing-up" period is now over and in the future the procedure can be used with relative safety and facility. So that others may not fall into error, the following list of dangers is presented.

1. In some cases not enough blood was given. For a baby of any size, at least 500 cc. is needed to supplant approximately 90 per cent of the original blood.

2. Transfusion was too long delayed. It should be done immediately after Coombs test results are known and the type of blood determined.

3. Blood was injected into the umbilical vein. In one case the umbilical vein ruptured, and in another thrombosis developed in the portal vein. The patients died.

4. Calcium was injected into the intravenous tubing. One patient died immediately afterward.

5. Protection of the infant against exposure, before, during and after the substitution, was omitted. Two infants had rectal temperature of 94° on admission to the hospital and two others had very low fluid intake for days before death.

The following plan of procedure eliminates the dangers listed and is relatively simple.

1. A set of indications should be established. (The author considers these factors as criteria: (1) maternal history indicative of erythroblastosis, (2) high maternal antibody titre, (3) baby born with evident disease or developing the disease in eight to 12 hours. Every decision is based upon the Coombs test reaction.)

2. Liaison with the obstetrician should be maintained so that titres are determined and transfusion can be undertaken without delay. In selected cases premature delivery may be indicated. The cord should be left long. It is probably best to clamp the cord early.

3. Helpful laboratory work on cord blood would be a cell count and smear for nucleated red cells, an icteric index, and a Coombs test.

4. The substitution should be as soon as possible.

5. The baby should be kept warm and in an oxygen tent from birth in severe cases.

6. The blood should be drawn out through the umbilicus, using the Diamond plastic catheter, and the substituted blood should be put in through the saphenous vein via a cutdown at the ankle. Two persons should do the substitution and the rate of injection should be exactly equal to the rate of withdrawal so that there is no chance of overloading the circulatory system. A 1:1,000 heparin solution in small amounts may be used to clean out the umbilical catheter if it becomes plugged.

7. Rh-negative, type specific blood should be used—at least 500 cc., and more if the maternal history indicates severe difficulty and the condition of the infant is poor.

8. Calcium is not really necessary. If it is given, it should never be injected into the tubing, but very slowly and directly into the vein.

9. After transfusion, the infant should be given fluids subcutaneously and kept in an oxygen tent.

10. Teamwork should be developed at the hospital among physicians called upon to treat erythroblastosis, so that one may be immediately available to assist the resident and to check on details.

Although substitution transfusion in the treatment of erythroblastosis has given disappointing results in Southern California thus far, technique is improving and ultimately a reduction in mortality rate may be achieved. It is noteworthy that in the last 12 cases (six quite severe) in which the procedure has been used, the patients have all gotten along well. Material for the Coombs test is now generally available to laboratories, and it is recommended that the test be used to assist in planning a course of action.

416 North Bedford Drive.

What's New in Pediatrics

Paroxysmal Tachycardia in Infancy

EUGENE B. LEVINE, M.D., *Los Angeles*

PAROXYSMAL tachycardia is rare in infants, although it is seen more frequently than it is recognized. It is important to the physician called upon to treat infants because it may be the cause of symptoms generally associated with a wide variety of other diseases, including diarrhea, pneumonia, and "idiopathic" cardiac enlargement. The symptom complex presented may lead to wrong diagnosis if the heart rate is not carefully counted. Paroxysmal tachycardia is important, too, as a possible cause of death, otherwise unexplainable, although it certainly does not underlie all or perhaps even the majority of unexplained and sudden deaths in infancy. Lastly, it is important because if the proper treatment is given, the response is uniformly satisfactory. Unless there is some associated and underlying disease which might of itself prove fatal, a situation which is not usual in such cases, treatment may well be life-saving.

In many instances the paroxysm will terminate spontaneously, without treatment, but as the condition is potentially dangerous, there is need for recognition and prompt treatment.

Review of the literature and solicitation of several hospitals and physicians in the Los Angeles area has yielded reports of about 100 cases of paroxysmal tachycardia in infancy. Less than 10 per cent of the patients had associated congenital heart disease. In almost 20 per cent of the cases the patient died, and although paroxysmal tachycardia with heart failure was not the true cause of death in all instances, still, some of these deaths might have been prevented.

DIAGNOSIS

As in many unusual conditions, diagnosis is based on a high index of suspicion and on careful examination, including accurate determination of the heart rate. Since infants cannot describe the palpitation that characterizes this condition in adults and directs attention toward the heart, the diagnosis is made from signs. The most common of these is failure to eat properly. Fretfulness and wakefulness may be noted, or the baby may be listless and drowsy. This may go on for several hours or days. Vomiting, or occasionally diarrhea, is present. Slight fever is usual, and leukocytosis is often noted. As the condition persists, signs of shock and of congestive heart failure appear, with dyspnea, tachypnea, cyanosis, hepatomegaly, cold clammy sweat, stupor, and, rarely, convulsions. The heart may be somewhat enlarged and there may be pulmonary congestion or pleural effusion. Auscultation will reveal very rapid heart action, often described as "too rapid to count," but careful study will permit accurate determination of the rate at least as fast as 250 per minute. It is rarely that the rate is slower than this in supraventricular tachycardia in infants, and in this respect it differs from paroxysmal tachycardia in adults, in whom the rate is usually between 150 and 250 beats per minute, often less than 200. Hubbard,[1] in 1943, reported one case of paroxysmal tachycardia in an infant with heart rate (proven electrocardiographically) of 353 per minute. The normal heart rate in infants is usually between 120 and 160. Sinus tachycardia at 200 beats per minute is not unusual, but paroxysmal tachycardia should be suspected if the rate is over 200 per minute and particularly if it is over 250 per minute.

Diagnosis is established by the electrocardiogram. This characteristically shows supraventricular tachycardia. Further definition as to auricular flutter or AV-nodal tachycardia is often impossible. Ventricular tachycardia is extremely rare in infancy, particularly in the first year of life. In the series reviewed it occurred in only five of 100 cases, and in four of these the diagnosis appeared questionable. If it is impossible to obtain an electrocardiogram to prove the diagnosis and the condition of the infant appears serious, it would seem reasonable and in the best interest of the patient to assume that a heart rate of 250 per minute or faster might be due to paroxysmal supraventricular tachycardia and to proceed with treatment based on this assumption.

TREATMENT

Digitalis is indicated. Many preparations are available, but it appears that lanatoside-C is the drug of choice. It is given intravenously (eliminating the uncertainties of absorption inherent in oral and subcutaneous administration), the dose can be accurately determined, and it has a wide margin of safety and is well tolerated.

No rigid criteria have been established for determining the proper dose, and various opinions have been expressed as to the tolerance and requirements of infants as compared to adults. A practical approach, and one that has proved satisfactory, approximates the application of Clark's rule, with

---

Assistant Professor of Medicine, College of Medical Evangelists, and Senior Attending Physician, Los Angeles County General Hospital.

Presented as part of the Panel Discussion on What's New in Pediatrics before the Section on Pediatrics at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

dosage based on the weight of the infant. One-hundredth milligram of the drug per pound of body weight may be given intravenously as the initial dose. After ten minutes each carotid sinus may be massaged. This is occasionally effective after lanatoside-C has been given, but not before. If the heart action has not become normal in 15 minutes, the same dose should be repeated. This is usually effective within 20 minutes. If paroxysmal tachycardia persists, one-half of this dose may be given after 30 minutes have elapsed, and may have to be repeated after another 30 minutes. Caution must be used not to overwhelm the infant with too much of this potent drug, lest the treatment itself prove fatal.

Rarely, lanatoside-C may not be effective, and in this unusual situation more dangerous drugs should be considered. In one such case, ouabain proved life-saving. The dose of this drug may also be calculated according to Clark's rule. Various other drugs have been tried, and there are several reports of the successful use of mecholyl, but the administration in each instance appears to have precipitated alarming and hazardous reactions, and even death.

PROPHYLAXIS

Once an attack has been terminated, the question of prophylaxis must be settled. Frequently there is no recurrence, and no prophylaxis is needed. Sometimes recurrences are so widely spaced that the value of prophylactic drug administration is questionable as it may seem more satisfactory to treat each attack on appearance. If the arrhythmia appears twice within a week or less, however, prophylactic administration of some potent digitalis preparation appears warranted, with the objective of maintaining full digitalization. The daily maintenance dose is approximately 10 per cent of the digitalizing dose. Daily administration of 20 mg., or slightly more, of digitalis leaf or its equivalent of tincture of digitalis is usually satisfactory. The same precautions regarding possible toxic effects are required in treating infants as in older individuals, and constant supervision is essential. Once prophylaxis is started it should be continued for at least a month and perhaps longer.

REFERENCE

1. Hubbard, J. P., and Starbuck, G. W.: Paroxysmal tachycardia in a two months old infant with a ventricular rate of 350, Am. Dis. Child., 65:582, April 1943.

L. T. Bullock, M.D., and H. Rollman, M.D., gave the author permission to summarize, for this presentation, certain data which will appear in greater detail in a forthcoming article, which will include a complete bibliography.

Fractures and Dislocations of the Carpus

KELLOGG SPEED, M.D., *Chicago*

SUMMARY

Although one-eighth to one-tenth of all fractures of the wrist are carpal fractures, they may be overlooked, unless attention is directed particularly to them in diagnostic examination. Symptoms may be slight or lacking, but diagnosis is important because such injuries may give rise to pain or disability later. There are certain guides and procedures in physical and roentgenographic examination which make diagnosis easier and more certain. Treatment depends upon the nature of the lesion. It must be based on all the knowledge obtainable by examination, mental review of the anatomy and pathologic changes, inquiry into the cause of injury, and the interpretation of roentgenologic findings.

IN all classes of civil, industrial and military medical service involving injuries, perhaps less is known by the average physician about carpal fractures than other skeletal injuries.

Although most if not all physicians would agree that their knowledge of and treatment for the common fracture of the lower end of the radius, the most frequently encountered injury near the wrist and the first cousin of carpal fractures, was satisfactory from all standpoints, their knowledge of carpal injuries is small. Clean-cut interpretation of these carpal injuries by the roentgenologist and the adoption of a workable standard of description or clinical classification have lagged behind the rate of their occurrence. Physicians now meeting these injuries daily in their work believe they are entering new fields; in reality they are merely observing their patients more closely and are being forced to understand definitely why apparently small and often unrecognized injuries lead to prolonged and painful disability.

Men working in machine shops and factories, struggling with artillery in the field and on the road, or employed in airplane service have undergone a large number of carpal injuries. Meekinson in a year's service in the Air Force encountered about 110 fractures of the navicular as enumerated in his report of June 1, 1944. Colonel L. H. McKim, as consulting surgeon of the Canadian Army, in two years encountered 125 navicular fractures, all of which healed without a single instance of nonunion. Other observers have reported smaller groups here and there; the aggregate is quite large. The proportion of these injuries will be maintained for a long time, and fortunately alert physicians and roentgenologists will now recognize them early and in so doing will treat them successfully.

ANATOMICAL CONSIDERATIONS

The anatomy of the bones, their encasing ligaments, their articular surfaces and synovial coverings, their range of movements and their all-important blood supply must be understood by the physician. Without this knowledge he cannot interpret the roentgenogram of acute or progressing lesions, the ancient or healing lesion. He cannot define the fracture or accompanying dislocation, and he consequently may be unable to apply the best line of treatment.

Clinically and anatomically the carpal bones are divided into two principal rows or groups. The proximal row contains the os naviculare, os lunatum and os triquetrum. The distal row comprises the os hamatum, os capitatum, os multangulum majus and minus and the os pisiforme. The radiocarpal joint is condyloid. Entering into this joint are the lower end of the radius, the distal surface of the triangular disk and the carpal navicular, lunate and triangular bones which fit into the elliptical and concave surface of the forearm element. The articular surfaces of all these bones are covered with cartilage and the joints are surrounded by strong capsular ligaments strengthened by interlacing dorsal and volar radiocarpal, intercarpal and two lateral ligaments, the radial and ulnar collateral ligaments. Flexor and extensor tendons crossing the carpus, bound by the annular ligaments of the wrist, further strengthen and protect the carpal joints to maintain a powerful attachment of the hand to the forearm.

The blood supply comes through the attachments of these ligaments of the carpal bones from small terminal volar and dorsal branches of the ulnar and radial arteries and the metacarpal vessels. Blood vessels do not enter the bones on the articular or smooth cartilaginous surfaces. The blood supply is consequently scant and not uniform and may vary with individuals or the different bones. The navicular has a natural wide variation of its blood supply, both in location and quantity, which may enter as a factor in healing or necrosis after fracture or injury.

Most radiocarpal motion occurs between the radius and proximal row of carpal bones both in the volar-dorsal axis and in the lateral motion. There is much less motion between the two rows of carpal bones at the mid-carpal joint and still less at the distal margin or carpometacarpal joint.

Presented before the Second General Meeting of the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

INCIDENCE

About one-eighth to one-tenth of all fractures of the wrist, including Colles' fracture, are carpal fractures. In order of occurrence the injuries of the carpal bones are: Fractures of the navicular in various parts of its body, dislocations of or around the lunate bone, fractures of the lunate, fractures of the navicular plus dislocations, injuries of the triquetrum, and complicated fracture dislocations involving the proximal row and the midcarpal and radiocarpal joints. Isolated fractures or dislocations of or around the bones of the distal row are quite rare but must be looked for after hand and wrist injury.

ETIOLOGY

The cause of a carpal fracture is usually a fall on the outstretched hand such as causes Colles' fracture. In the face of definite fracture of the radius and demonstration of it by roentgenogram, the surgeon may very easily overlook an accompanying injury of the carpal bones. This is particularly so because the first film made soon after the accident may not show a definite plane or line of fracture across the injured carpal bone, as has been observed in many injuries of the navicular. The cause may be a minor blow or even a twist of the wrist, under pressure or strain; it may be forgotten by the patient. Later symptoms and findings bring out the pain and disability of real bone injury, and the roentgenogram finally shows the fracture plane or the resulting change of density of fragments or aseptic necrosis, usually resulting from interference with blood supply and enforced use or lack of rest and splintage.

Suspected injuries of the carpus must consequently receive careful and complete physical and x-ray examination at the time of injury. In event of real complaint of pain or local tenderness, the wrist may profitably be put at rest on a splint with the hand in neutral position, followed by reexamination after one or two weeks by roentgenogram for delayed-appearing planes of fracture, even when no primary separation of fragments is found. Evidence of necrosis of parts of the bone involved resulting from changed vascular supply, as betrayed by changes in density compared to neighboring bones, must be searched for in the roentgenogram. The navicular is the worst offender in this class of injury, because it is the most often injured carpal bone, because it has the greatest range of movement in the carpus, because its blood supply is the most variable and because on account of its anatomical situation it is subject to the greatest strain and compressions. Direct violence from blows on the wrist may likewise cause these injuries, often without open wounds.

Violence of a fall or blow on the wrist may lead to a mere crack across the bone involved — most often the navicular—with resulting pain which may interfere with functional use of the hand and yet may entail, immediately afterward, no evidence of displacement of fragments, comminution or compression, or, most unfortunately, even the finest plane of fracture in the roentgenogram. Sometimes this plane is so faint, so indefinite, that it is considered by both roentgenologist and the examining physician as a normal marking of the bone and is, at least temporarily, not recognized for its true worth. Compression or twist violence or fall may not cause separation of fragments. These often interfere with the continuity of the bone surface; both cortical and internal cancellous bone may be cut off from precarious blood supply, resulting in local aseptic necrosis, slight bone absorption and ultimate appearance of a fracture line or plane seven to 14 days later. When separation, impaction or comminution are caused at the time of fracture, roentgenologic recognition is not difficult and the fracture then is seldom overlooked.

These descriptions apply mainly to the navicular; they may apply to any of the proximal row of bones; they may even apply to the distal row of bones, and the condition may develop there very slowly. The lunate often suffers compressions, early unrecognized, only to undergo late aseptic necrosis with increased bone density as compared to surrounding bones seen in the roentgenogram. The day or incident of the causative trauma may be forgotten. A physician may be able to determine how old such a condition may be from the depth of the increased density of the bone, from the reaction of surrounding bones displayed by new bone formation or natural effort at fixation of the intercarpal joints by osseous outgrowth, or by shrinkage and collapse of the individual bone and the reaction of the wrist by pain, fixation and atrophy of soft structures. The injured person may then be entitled to consideration of injury forgotten or overlooked both by himself and his physician.

From a pathologic standpoint, fractures of the navicular may be divided into several groups. The first classification is recent or ancient fracture. The second is whether the lesion is fracture of the tubercle, ordinary transverse fracture, usually seen near the center of the bone, comminuted fracture which may involve the whole body or simply one of the fragments of it, proximal or distal to a transverse dividing plane through the bone. Impacted fracture, usually through the body of the bone, is still another type. This results in impaction of the distal fragment into the proximal along a rough irregular plane with some axial deviation of the distal portion and longitudinal splitting of the bone, which is very rare. Some transverse fractures are near the proximal end of the bone and lead to early necrosis of the proximal fragment, which is thus quite completely cut off from arterial blood supply via the small nutrient arteries and devoid of periosteal blood supply because the fragment lies almost completely free from ligamentous attachment as a loose intra-articular portion.

Dislocations. Pure dislocations which almost always involve the lunate, or the fracture-dislocations which may involve the proximal half of the navicular and all the lunate, are difficult to read in the roentgenogram. These two pieces may be dislocated out of the radiocarpal joint or retained there. If retained in normal relationship with the distal articular surface of the radius, there may be accompanying dislocation of all the rest of the hand and carpus around the two portions mentioned either dorsally onto the top of the wrist or in volar direction. They may cause great pain, swelling, stiffness and gross loss of function of the hand and immediate complications from nerve involvement (median). There is local hemorrhage, tearing of ligaments and finally extensive bone necrosis from interference with circulation unless reduction is made or misplaced bone is removed to permit normal blood flow over intact avenues.

DIAGNOSIS

The symptoms of carpal fracture may be very slight or lacking. An injured individual may never report for professional examination, unless working under control and ordered to do so, even for sprained wrists. Physical examination should be painstaking and thorough, with both arms fully bared for viewing and comparison of range of motion in the wrist joint. The patient should sit with hands comfortably outstretched on a clean surface. The range of wrist motions, *without movements of the forearm, arm* or *shoulders*, should be tested and compared in all directions. Local tenderness over the proximal row of carpal bones, and then over the distal, should be searched for. The anatomical snuffbox should be tested by the tip of the examiner's index finger or the dull end of a pencil with the patient's thumb held outstretched. Tenderness here leads to suspicion of navicular injury. All swelling, over-thickness, lessened range of motion in the wrist and numbness in the fingers, especially in the median distribution, should be noted and recorded. The examination should be gentle. All findings should be recorded in writing.

Roentgenographic Diagnosis. A roentgenogram should be made in at least two planes with the center ray directly over the radiocarpal joint. The lateral view should show the forearm so that the shadows of the two forearm bones overlap exactly, thus giving a clear shadow study of the usual relationship between capitate, navicular and lunate in the carpus. If any other bone than the navicular is suspected of injury, additional oblique films may be required to throw the shadow of the bone suspected of injury out into clear profile view. The physician should not be satisfied with any film which does not give clear definition of the suspect area. The film should be studied carefully and methodically. It takes much practice to learn to read carpal films.

Even if a fracture plane in the navicular (most common injury) is not seen, if no dislocation of carpal elements is found, the patient should not be dismissed too easily. Support should be applied and the patient told to return in a week or ten days for another film. This must always be done if any pain or disability persists and is the best plan for all patients in the long run.

TREATMENT

Treatment of carpal injuries must be based on all the knowledge obtainable by the examination, a mental review of the anatomy and pathologic changes, an inquiry into the exact cause and nature of the injury and an interpretation of the roentgenologic findings.

Treatment of Open Wounds. Immediate treatment after diagnosis of fracture or fracture-dislocation depends on the nature of the lesion. If an open wound exists, it must be surgically cleansed and débrided, even if it is but skin deep. If there is a deeper laceration with joints opened into and possible nerve or blood vessel injury, the surgical care becomes a major procedure. It should not be attempted in any other surroundings than a properly prepared operating room. To minimize loss of tissue, unnecessary extension of wounds, loss of blood and in-carrying of additional infection from unwise sponging or manipulation, and to render the repair as anatomically perfect as possible, the operation must be performed under general anesthesia and with the use of a constrictor on the arm to ensure a bloodless field. During the repair of soft parts injury and exposure of the carpal joints and bones, a complete reduction of the fracture, its fixation if required, or a reduction of the fracture-dislocation under direct vision in an open wound may be possible. This may entail the use of strong traction (by assistants) on fingers or hand, counter-traction on the forearm, and manipulation. If instrumental aid is required to assist in open reduction of displaced fragments, this help must be of the most gentle character to avoid injury of the cartilaginous joint surface of any bones and also to avoid further jeopardy to the already interfered-with blood supply by tearing or stretching of ligaments. The highest degree of preparation of an aseptic field and maintenance of aseptic technique in the operation must be obtained. After reduction, the use of antibiotic drugs may be indicated as in any open wounds or fracture, according to the nature of the wound, its soiling or the surgeon's practice. Hemostasis must be secured by minimal ligation, nerves should be approximated and sutured if possible, and severed tendons may be identified but not always primarily sutured, depending on the surgeon's ability and the nature of the soiled wound.

Dressing and Splinting. The wound is dressed, either with loose vaseline gauze pack or as a finished closed débridement. The hand, wrist and forearm are splinted with moulded plaster of paris strips laid on dorsal and volar surface, over adequate wound dressings, in a neutral position or one demanded to maintain reduction by the character of the fracture or fracture-dislocation. Wound dressing is performed as infrequently as possible. Each dressing may require removal of splintage, in which case there must be adequate help to hold the hand and forearm in quiet position. If the wound remains aseptic, the length of time for immobilization will equal or exceed by 50 per cent that required for the healing of the ordinary closed lesion.

If there is no open wound and no fracture or fracture-dislocation verified by the examination and the roentgenogram, but there is evidence of local tenderness, interference with function and complaint of pain, the hand and wrist must be immobilized either on a padded splint or in a moulded plaster of paris splint. If injury of the navicular is suspected, the splint must extend from the metacarpophalangeal joint to just below the elbow with the hand in a straight position. The thumb should be partly abducted, fully extended and immobilized nearly to the tip, which may be left exposed so that the circulation may be observed. After seven to ten days a second roentgenogram may be made through the plaster. Developing planes of absorption or definite fracture often appear plainly through the encasing splint. If they are found, the splint, not having been removed, does not have to be replaced, thus gaining the advantage of not moving the fragments after their first fixation in the plaster. The time elapsed since the injury was first splinted can then be added to the total number of days required for complete immobilization of the wrist.

Fracture of the Navicular. For fracture of the navicular, a closed and isolated injury, immobilization in plaster of paris must be employed as soon as a diagnosis is made.

Fracture of the tubercle with adequate natural blood supply usually heals rapidly in two to four weeks, without definite immobilization but with restriction in use. During the healing period roentgenologic control is used to show proof of bony union and to confirm full use of the hand.

Whichever type of fracture of the body of the bone may be present, it is doubtful that local pressure or manipulation may change the angle or approximate the surfaces more evenly unless a dislocation exists. If fragments are dislocated as in fracture-dislocation, a manipulative effort under anesthesia is indicated to restore approximation. Any rough manipulation or undue pressure may add to interference with local circulation and increase the time required to restore it and to establish bony union in the bone. Consequently the hand and forearm are gently cleansed, washed with alcohol, covered with stockinet (including thumb in added small stockinet cover) and held in neutral position by a reasonably heavy plaster of paris circular dressing from the elbow to finger bases. A sling may be used during the first few days after splinting until the plaster has hardened and any edema in the hand is absorbed. The author finds it advantageous to pad the ulnar styloid with a small piece of felt to avoid painful pressure later. A quite heavy plaster is indicated because the patient may return at once to work or other activity and not carry the forearm in a sling, but may use and move the arm and fingers where free, thus avoiding muscular atrophy and diminished circulation in the arm as a whole. Likewise the arm thus used is subject to innumerable jolts and blows daily which may indent or break the plaster and lead to replacement long before the surgeon wishes to remove it or x-ray the bone for progress in healing.

For young vigorous adults and adolescents this dressing must remain undisturbed from six to ten weeks if it can be made to wear that long. To remove the plaster encasement, it is cut along the radial side and out along the thumb portion so that it may be spread and slipped off *without moving the wrist.* Immediate roentgenogram is then made to inquire into the amount of bone healing. When bone healing is quick the fracture plane as such may be obliterated in six to ten weeks. The hiatus, if any, at the site of fracture will be filled with calcified osteoid tissue. In six or ten weeks this will probably not be mature and organized into well-defined bony trabeculae similar to the markings found in the body of the bone, but it may represent a clinical union on its way to maturity provided the wrist is not mistreated by overuse. If such a condition of plastic union is found, the splint may be left off, the patient advised to start use very gradually and gently and to spend time massaging finger joints, exercising the hand by squeezing a suitably sized ball, but not by forcing wrist motion. The author is of the opinion that too hot applications or soaking of the hand and wrist are contraindicated in the further rebuilding and maturing of this still untrabecularized bone. Gentle, steady, active use by the patient—nothing forced or strongly manipulative—is indicated. Within a month a second roentgenogram should show further maturity of the bone, any local soreness should have disappeared and the function of the wrist and hand should be much improved. If this is not found and there is evidence of absorption of osteoid tissue about the fracture plane or planes, the hand and wrist should again be immobilized as before. It is far better to give an apparently too long immobilization than a too short one.

If, after the removal of the plaster as outlined, the fracture appears not united, a circular plaster of paris dressing should be reapplied at once, without movement or any manipulation of the wrist. The dressing should be worn an additional period of six weeks and the fracture site reinvestigated by x-ray. Several such plaster dressings may be needed to obtain a final bony union, proven by x-ray examination and verified by painless increasing range of motion and functional use. Some patients require as long as 10 to 14 months of such treatment.

Dislocation. If fracture-dislocation is present, is diagnosed, is understood in the displacement of its various components, the surgeon must make every effort, in the case of recent injury, to effect manipulative reduction. This can only be obtained under full anesthesia and with sufficient assistance, especially in the case of manual laborers who have powerful wrists and forearms. The patient is rendered completely lax by the anesthesia. The shoulder of the affected arm is partially abducted and the arm is held by an assistant in that position, grasping *firmly* with both hands, with his feet well planted on non-skidding floor, as far out of the operator's way as possible. Two assistants may be helpful—one on the opposite side of the table from the operator.

Depending on the type of dislocation, whether dorsal or volar, the operator then plans the manipulation. The first step is a *prolonged traction on the hand,* while assistants make the counter-traction. Traction is maintained in the direction opposite that of the dislocation: For example, in volar dislocation of capitate and other distal row bones, the pull is slightly upward and in full extension. This must be kept up several minutes and during the course of traction the bones may be felt sliding into place. If this is not successful at first, it must be repeated and can be helped by the pressure from the thumbs of an assistant against the overriding bulging mass of bone at the dislocation site on whichever side of the carpus the bulge exists. Prolonged effort and much strength, smoothly and persistently applied along with deep anesthesia, will usually effect reduction, after which an x-ray film is made at once and the forearm, wrist and hand put in a plaster dressing as described for simple fracture. Some care has to be taken of the amount of swelling; the radial pulse must be certified; the sensation and movement of the fingers checked and the condition recorded in writing as soon as anesthesia passes off. The length of time of immobilization must be gauged by the fracture more than the dislocation. Bony union must be obtained before use and movement are started; if not, the result may be a reduced dislocation but an ununited bone.

If manipulative reduction does not succeed under anesthesia, it is best to desist for the time, to cleanse hand and wrist and encase in a sterile dressing or towel, elevating the hand on a pillow for a short time. If no bullae appear, another x-ray check may be permitted and plans for operative reduction or excision of bone fragments planned. The physician should not be in too much of a hurry, for he must make sure the skin is clean and can be rendered aseptic for what may prove to be a long and difficult operation.

The navicular and lunate take the longest time to heal after fracture-dislocation. The author has observed earlier and successful unions in the triquetrum—eight weeks in two cases. The pisiform often takes ten weeks.

ANCIENT FRACTURES

Diagnosis. Ancient fracture may be diagnosed when the patient is seen late—several weeks after injury—when there have been inadequate efforts at immobilization or none at all, or when the injury has been called a sprain or has been unrecognized, or when the patient has not previously consulted a physician. The symptoms of pain, local tenderness, restricted wrist motion, slight deformity and functional interference persist in a varying degree—some not unpleasantly, others in great intensity. There may be evidence of nerve injury, especially the median or its branches. The roentgenogram shows a spreading area of necrosis around the fracture plane, cystic absorption of much of the body of the bone (especially the navicular) or fragmentation, increased density as compared to its neighboring bones, and sometimes new bone formation extending from adjacent bones into the joint areas about the fractured bone. Some patients appear five to ten years after fracture with pronounced cystic changes in the interior of the bone and increased density of the partially dead and partially healed cortex.

Treatment. Some ancient fractures, even with the advanced pathologic changes suggested, may yield to prolonged immobilization as described. The fracture dislocations will not thus yield because much of the functional disability in them is mechanical, as in an unreduced dislocation at any joint. In such cases, well planned excision of bone is required, freeing enough space to permit some hope of recurring motion when the muscles moving the joints become reeducated. Such excision of bone should attempt to stick to old joint lines and leave intact cartilage behind. For instance in a transnavicular perilunar dislocation, ancient and unreduced, the indication would be to perform a carpalectomy—a removal of at least two of the proximal row carpal bones, namely lunate and navicular, including the navicular fragment adherent to the distal displaced row, and closure of the wrist with subsequent early motion and muscle training. This operation must be done without adding any injury to bones, cartilaginous surfaces of adjacent joint, nerves and tendons in the area opened. It can only be done under general anesthesia, under a constrictor, with suitable instruments and adequate anatomical knowledge of just what structures are being excised. In some instances the triquetrum must also be excised along with the other two bones. The capitate then retracts to the articular surface of the radius, a new joint motion is obtained between capitate and radius, and a reasonable functional return is achieved, with an almost undetectable shortening of the carpus. Careful planning of the amount of postoperative splinting, starting of motion and massage must be done in each case.

For the uncomplicated ancient fracture (as of the navicular alone) surgeons must have some operative attack when prolonged immobilization is refused or is objectionable from any standpoint. Such methods are: (1) Complete excision of the offending ununited bone, leaving a hiatus in its place or inserting a replica of vitallium or other metal in the defect; (2) attempts to overcome the nonunion by (a) drilling across the fracture plane, (b) insertion of one or more small bone transplants. In cases of long standing in which the surgeon cannot be sure whether or not dislocation may have been a complication, fusion of the radiocarpal joint may be the procedure to relieve pain, to strengthen the joint and ultimately to increase the functional use even in the face of the permanently stiffened articulation.

Complete excision of the offending bone is frequently done for irreducible dislocations of the lunate, some of which may not be so ancient. The carpus seems to get along quite well without this bone. Incision is made on either dorsal or volar surface of the wrist under anesthesia and constrictor, and no structures in the wrist should be damaged. All tendons, nerves, etc., should be gently retracted. The annular ligament may be cut but must be resutured and the articular surfaces of the remaining bones must not be damaged. Tight closure and little if any splinting are required after this relatively simple excision of the lunate alone.

Excision of the proximal row is much more difficult, especially when it is necessary to find and bring out the distal fragment of the fractured navicular, which clings to the distal row. It is an operation of major difficulty and the instructions given for all such operations must be followed.

For excision and fusion of the radiocarpal joint the author prefers an approach on the ulnar side of the wrist, partial excision of the lower end of the ulna and a block of bone thus obtained tucked into the area to be fused. This is followed by prolonged plaster of paris splinting.

Ancient or ununited fractures of bones — the navicular, as an example—which are to be left in place and cared for by operation may be treated by drilling through a small opening in the "anatomical snuffbox" at the base of the thumb, using x-ray control at the operating table to be sure of the direction and extent of insertion of the drill. Long immobilization in plaster is required with the same criteria for establishing union as after nonoperative treatment. This method has been used successfully many times by the author; it is simple and apparently highly efficient.

Bone Transplants. Bone transplants have also been used to obtain union in ununited carpal bones (navicular). The transplant may be inserted in a prepared bed in the bone after dorsal exposure, or it may be inserted through drill holes made via the snuffbox. The first-named method is a little grosser and may interfere further with the blood supply of the bone. Via the snuffbox the operation is delicate, but quite sure, and no interference with the vascular supply of the navicular need follow. Both methods require the usual subsequent prolonged immobilization. Functional results may not be forthcoming for one or two years after operation and then may not be up to the patient's expectation, yet pain and other symptoms may be absent.

Metallic Insertions. Recently Waugh made some vitallium replicas of the carpal navicular to be inserted in the site of ancient fractures after removal of the fractured navicular bone. As yet, few such substitutions have been done in man. It may offer a quick way out for the comminuted fracture, for the complicated fracture-dislocation, and the non-united or ancient fracture with or without cavitation in the bone. The author believes that, with the small amount of range of motion in the radiocarpal joint, no analogy can be drawn as between this operation and the result following the insertion of a vitallium cap on the head of the femur in the wide normal excursion of the hip joint. The author has examined some of the patients thus operated upon. In most cases there was restricted motion but not much pain.

122 South Michigan Avenue.

* * *

Cancer Detection Centers

The Experience to Date in California

L. HENRY GARLAND, M.D., *San Francisco*

SUMMARY

Cancer "detection centers" (that is, centers for the examination of presumably well or asymptomatic persons) have been tried out in four different California communities during the last three years. In all instances—as in most other such centers throughout the United States—they have not been successful in restricting examination to well persons.

The detection centers in California may therefore be described more accurately as "cancer examination and detection clinics."

Three of the four centers have been closed owing to the small yield of cancer cases discovered, plus the fact that the cost of operation exceeded the total available funds of the local branch of the Cancer Society. In addition, it was extremely difficult to obtain and maintain competence on the part of the professional staff in such centers.

A more practical approach to the problem of earlier tumor detection would appear to be emphasis on making "every physician's office a detection center," and stressing the annual examination of persons over 40 years of age for tumors in the five common accessible sites. These are the tumors most readily curable today.

EARLY in 1946 the Cancer Commission of the California Medical Association decided to support the trial of a few medically sponsored and supervised cancer detection centers to be located in different areas of the state. To that end, it drafted a set of minimum standards for such centers, and the standards were approved by the Council and House of Delegates of the State Medical Association on May 9, 1946.

Four pilot centers were developed by local county groups and had operated for from 17 to 25 months at the time of the preparation of this report. They were located in Santa Barbara, Fresno, San Francisco, and Ventura. Three of them have now closed. The experience with all four to date constitutes the basis of this report.

TERMINOLOGY

Initially, the term "Detection Clinic" was used, but, since "clinic" implies to many persons a place wherein the *sick* are diagnosed and treated, and since detection agencies were designed for the examination of apparently well persons, the term *center* was soon substituted. This, of course, did not eliminate confusion; it merely reduced it.

To aid in clarifying the functions of the various cancer-fighting agencies of the medical profession and the American Cancer Society, the following terms were developed and have been used in the state:

1. *Cancer Information Center.* This center is a county branch office of the state division of the American Cancer Society, which attempts to furnish information to inquirers on matters pertaining to cancer prevention, diagnosis, or treatment. As a general rule, the center refers patients or examinees to physicians chosen in rotation from a panel furnished by the local county medical society, or, in the case of indigents, to a suitable free clinic as near their residence as possible. While detection centers were being tested, a certain number of applicants were referred directly to them.

2. *Cancer Detection Center.* This was a pilot center to which it was planned to direct for examination only those persons who had no signs or symptoms of tumor. It was operated by local agencies, with the approval of the local county medical society, and the support of the local branch of the Cancer Society. Funds of the latter were augmented by a nominal payment by some examinees, and by money from other sources such as the State Division of the American Cancer Society.

3. *Consultative Tumor Board.* This is a volunteer board composed of physicians and surgeons interested or qualified in cancer work (especially pathologists, surgeons, and radiologists), which meets periodically in a given hospital or other medical institution, and offers advisory recommendations as to diagnostic or therapeutic procedures on patients referred by other physicians. It provides *consultation* on adequately worked-up cases.

4. *Treating Physicians and Surgeons.* These are radiologists, surgeons, and other physicians to whom patients are referred for treatment.

In the above list of agencies the terms "clinic" and "facility" are carefully avoided. Some "cancer clinics" furnish only simple physical examination; others furnish complete diagnostic studies; a few provide complete diagnostic and therapeutic serv-

---

This report has been submitted to, and approved by, L. C. Kinney, M.D., Chairman, and Frederick Hook, M.D., Medical Director, the Cancer Commission of the California Medical Association. The author is a member of the Cancer Commission.

Read before the National Conference on Cancer Detection, sponsored by the American Cancer Society, Portsmouth, New Hampshire, September 9-11, 1949.

ices. Some are for indigents only; others accept only pay patients. It cannot always be determined from a distance which function a given "cancer clinic" fulfills. Therefore, until such time as there is clarity regarding the services actually available, it may be best to defer using the word. For the same reason "facility" is eschewed. A building may contain microscopes, stains, and technicians, but without a competent tissue pathologist it is of little value to the public or profession as a cancer diagnostic agency. Similarly, an x-ray unit or a few capsules of radium (both of which are often referred to as therapeutic facilities) are worthless without an accompanying physician trained in their usage.

MINIMUM STANDARDS—THEORY

The work of the early detection center advocates led to the following definition being adopted by the American Cancer Society and approved by the American Medical Association:

"The cancer detection, cancer prevention or well-person clinic is designed to detect abnormalities not producing symptoms sufficient to send the patient to the doctor. These clinics do not diagnose or treat diseases."

In order to underline this aspect, the following Statement of Purpose was issued in 1946 by the California Cancer Commission:

"The purpose of the 'detection clinic' shall be to make periodic physical examinations of presumably well persons to discover early chronic disease with special emphasis on the early recognition of cancer or lesions that may lead to cancer."

The Minimum Standards for Detection Centers adopted by the California Medical Association in May 1946 are:

"1. The 'detection clinic' shall have the continued approval and support of the county medical society. The clinicians must be members of that society.

"2. The clinic must be conducted in the outpatient department of a Class A medical school or an approved hospital. If located away from the institution, it must be operated as an integral outpatient department of that institution.

"3. Where there is no approved hospital or medical school in the community, the 'detection clinic' will be operated by the county medical society and all of the activities will be under the immediate supervision and control of the society. The clinic shall be conducted in a local hospital unless special approval is granted by the Cancer Commission after careful investigation.

"4. The clinic shall be supervised by a physician who has had training and experience in the diagnosis and treatment of cancer.

"5. The clinic shall have proper housing and adequate facilities and supplies to conduct complete physical examinations. The clinical laboratory and x-ray departments shall be easily accessible to it.

"6. A sufficient number of clinicians shall be available to conduct the clinic at regular intervals and to provide for complete physical examination of every patient accepted by the clinic.

"7. Adequate records shall be kept of the history, physical findings and recommendations, and of the disposition of patients. Sufficient personnel shall be available to provide for necessary nursing, stenographic and record services.

"8. The examination shall include: (a) history; (b) routine blood count, urinalysis and serology; (c) x-ray film of the chest (mass survey); (d) nose and throat examination, including lips and intraoral; (e) examination of the breasts; (f) physical examination of the chest, abdomen and extremities (including skin); (g) examination of lymph nodes: neck, axillae and groins; (h) pelvic examination; (i) rectal examination; (j) Papanicolaou vaginal smear (where feasible).

"9. Examinees that present suspicious history or abnormal physical findings shall be referred to their family physician for diagnosis and treatment. If there is no family physician, the patient shall be referred to a physician or clinic as directed by the policy of the county medical society.

"10. A summary of the pertinent facts and recommendations of the clinic shall be sent to the physician or clinic to whom the patient is referred.

"11. One month after such reference to physician the case shall be followed up by letter or social service visit and a complete report of the diagnosis and treatment shall be obtained.

"12. Only presumably well adult patients will be accepted for examination. No patient under treatment for cancer will be accepted without permission of the attending physician.

"13. Examinees shall be expected to make uniform contributions toward the expenses of the clinic if able to do so, but this shall not be in excess of the established cost of the examination.

"14. All publicity concerning the clinic must have the approval of the county medical society.

"15. Regularly scheduled periodic meetings will be held by the staff to study, review and follow up the cases seen in the clinic. An annual report of the work of the clinic will be sent to the Cancer Commission."

MINIMUM STANDARDS—PRACTICE

In practice, it was soon found impossible to limit examinations to presumably well persons. For one thing, local physicians sometimes thought the center *was* a free diagnostic clinic and referred deserving symptomatic persons for study and the social service worker or attending nurse was loath to turn them away. For another, persons who had been given a diagnosis of cancer elsewhere came in saying that they "felt quite well but wished a check-up." When the sincere and hard-working physician (who had often just examined a score of persons without evidence of cancer) triumphantly found a stony hard prostate (and a chest x-ray was reported as showing metastases), the patient merely remarked, "Well, I wanted to be sure that those university hospital doctors were right!" Such examples are not exceptional.

In none of the four "pilot" detection centers, *therefore, were examinations confined to presumably well persons without symptoms.* It was impossible to do so. The following figures accordingly represent the results of examination of a miscellaneous group of persons, symptomatic, follow-up and otherwise:

In the four centers, 2,479 persons — 342 males and 2,137 females—were examined between October 1946 and August 1949.

From the data available, it is estimated that not more than five cases of cancer were detected in persons without symptoms. All of the other cancers detected were in persons with frank tumors in the lip or breast (who came for advice), or in persons with symptoms such as bloody vaginal or rectal discharge, who presented themselves for free or part-pay diagnosis and treatment.

Including these persons with symptoms and some who had obvious recurrences and were seeking follow-up examination, a total of 40 proven cancers was reported.

In Center A, 748 persons were examined during a period of 25 months; 25 cancers were observed.

In Center B, 930 persons (females only) were examined during a period of 24 months; 7 cancers were observed. (Skin 2, nasal cavity 1, breast 2, cervix 2.)

In Center C, 376 persons were examined during a period of 17 months; 8 cancers were recorded. (Lip 2, breast 3, cervix 2, sigmoid colon 1.)

In Center D, 425 persons were examined during a period of 18 months; 14 were suspected of cancer; 11 of these are now under observation and one is scheduled for operation.

Of the entire group of 40 persons with established cancers, 38 have been given some form of surgical or radiological treatment, and in a majority of these cases, the cancer is recorded as arrested at present.

OTHER FINDINGS

In addition to cancers, other lesions were, of course, discovered. Some of these were justifiably labeled precancerous and the finding of them represents a worthwhile yield. However, the term precancerous is not calculated to diminish cancerphobia in the susceptible, and should be used with greater discretion than was shown by one center which listed as precancerous the following entities: 1. Verruca; 2. Pigmented nevus, axilla; 3. Fibromyoma uteri; 4. Suspicious smear. The psychologic damage resulting from casual use of the term precancerous, or from giving a false positive diagnosis of cancer, is not to be lightly regarded.

Some persons were found to have ailments such as hypertension, emphysema, arthritis, and so forth, which resulted in referral to physicians and, presumably, in benefit to the examinees. Space does not warrant a complete listing of these findings herewith.

DISCUSSION

The concept of the detection center for apparently well persons is understandable and logical. However, when it is realized that about 50 per cent of cancers occur in non-accessible sites (internal organs, etc.) and that the early recognition of small curable cancers in these sites is extremely difficult, the practical problem is obviously considerable. The sifting of a population of over 10 million persons in one state alone would require a medical and nursing force not available therein today; indeed, with a yield of only about one cancer per 1,000 "well persons" examined, the maintenance of interest and diagnostic acuity on the part of the corps of examining physicians would appear to be an aim insuperable.

The early diagnosis of accessible cancers (skin, breast, etc.) is more difficult than many persons appreciate. Even when surgically removed tissue is available, histological criteria are not always black or white. This point is well illustrated by Willis[9] in the early chapters of his textbook on tumors.

Other observers[7] have stressed the practical problems involved in any large-scale cancer detection center program, namely:

1. Long waiting periods before examination (up to nine months).
2. Extreme difficulty of maintaining competent professional staff.
3. Lack of uniformity or completeness of examination.
4. Tendency to syphon off all available funds for local cancer work, to the detriment of other parts of the cancer control program.
5. Perplexity of examiners and lay volunteer workers at the fact that no cancers may be found in the first several hundred persons examined.*
6. Absence of adequate follow-up to ascertain if those advised to secure treatment really did so.

Curphey[3] has commented on the 5,279 female and 877 male persons examined by the five cancer detection centers in Philadelphia between 1944 and 1946. In this group 24 cancers were found, distributed as follows:

Females: Fourteen cancers of accessible sites (breast, cervix, skin); five cancers of inaccessible sites (fundus uteri, gallbladder and abdominal area).

Males: Five cancers of inaccessible sites (prostate, ileum and lung).

Curphey regarded only 14 of the 24 as salvageable, and concluded that: "Such a record is distinctly discouraging and establishes the fact that no matter how well organized and medically efficient the detection clinic be, there is little it can offer to the patient with inaccessible cancer at this time."

He calculated that the yield throughout the 240-odd detection centers in the United States is about one case per 100 patients with symptoms, and only *one per 1,000 without symptoms.* Further, the bulk of those detected were cancers of the skin, breast and cervix.

---

*Levin estimates that there are about 218 new cases of cancer per 100,000 population per annum in New York State. The annual incidence of four common types is approximately as follows: Breast 80, cervix 34, stomach 22, lung 16.

It has been stressed by Willis and others that about 15 per cent of cancers in males and 45 per cent of cancers in females involve accessible organs. In a paper presented before the annual meeting of the American Radium Society this year, the author reemphasized that *these tumors of accessible sites are the ones most often cured.* Ayre[2] has stated that: "In the female, if patients attending a physician for a routine cancer examination had no further examination than a simple cervical smear or scraping, a breast palpation and a rectal examination, more cancer would be detected per patient than with any other known system of cancer examination."

From the foregoing, it seems obvious that routine examination of apparently well persons yields too small a number of curable cancers to be a practical procedure at present. Examination of selected groups, such as adults over 55, might yield five cases per 1,000 (Levin[6]) but, if the inaccessible lesions were excluded, the yield would probably be closer to 2.5 per 1,000. Confining examinations to females would be a still more worthwhile procedure, from the statistical viewpoint.

It is believed that stimulating every physician to make his office a detection center for accessible tumors would be a most practical approach to the problem on a statewide basis at the present time.[4] If every adult over 40 years of age were to have a simple physical examination (inspection and palpation) of five common accessible sites, annually, more cancer would be detected in a curable stage than by any other method at present available. These five sites are: Skin, lip and oral cavity, breast, cervix, rectum and rectosigmoid.

Such preliminary examinations need involve no laboratory work, x-rays, smears or other special tests. It is quite agreed that the results of properly performed cytologic studies of vaginal, bronchial, gastric and urinary secretions are sometimes a good clue to early cancer. However, such tests on a statewide basis are not yet technically feasible.

The "tumor clinic" is commonly spoken of as a place for the diagnosis and treatment of cancer. However, if most cancers are to be diagnosed early they must be sought when they are first detectable—in the practitioner's office. The practicing physician is the person whose interest we must hold in order to make significant advance. His is the best, most widespread and most economic "detection center."

MULTIPHASIC SURVEYS

It has been stated, with reason, that cancer is only one of the disabling entities of age, and that the periodic detection examination should include a check for hypertension, articular disease, pulmonary tuberculosis and diabetes, in addition to routine urinary and serologic tests. On a small scale, such procedures seem feasible. Statewide, it is not readily apparent how they could be achieved with maintenance of any degree of diagnostic quality or accuracy.

FREQUENCY OF RECHECK

If periodic detection examinations are in order, how often should they be repeated? Kirklin[5] has shown that quarterly roentgenologic studies would be necessary to detect early gastric cancer. Sante[8] has observed that chest surveys should probably be repeated quarterly to be of value as a representative picture. If repeated on a mass scale every three months they "would soon become one of the principal enterprises of the nation." For practical purposes, an annual recheck of accessible sites would appear to be the most feasible approach at the moment.

POSSIBLE ALTERNATIVE PROGRAMS

If cancer detection centers are not practical or worthwhile, what then should be done? Several years ago, Ackerman[1] suggested one alternative as follows: "Without disrobing the cancer detection clinics of the nobility of their aims, it may be justly considered whether the effort and expense cannot be put to better service in increasing and sponsoring the facilities for training of specialists (tumor pathologists, radiotherapists, and surgeons) on the skill of whom the therapeutic results will greatly depend." If the author might comment on this, he would stress the great need for additional numbers of tumor pathologists.

Therefore alternative number 1 for the American Cancer Society might be an intensive program to secure more qualified pathologists throughout the country. Number 2 would be to aid state medical associations to encourage their members to make *every physician's office a detection center.* Number 3 could be to support all bona fide voluntary health insurance plans to the end that every potential cancer patient is able to arrange for *his own medical and hospital care,* if and when needed.

The Cancer Society has taken the lead in public education on cancer, and has greatly aided research and professional education in cancer. Can it now direct the detection program along more evolutionary lines?

450 Sutter Street.

REFERENCES

1. Ackerman, L. V., and del Regato, J. A.: Cancer, C. V. Mosby, St. Louis, 1947.

2. Ayre, J. E.: Detection of cancer, J.A.M.A., 139:1020, April 9, 1949.

3. Curphey, T. J.: Cancer detection clinics, Nassau Med. News, 22:1, Jan. 1949.

4. Editorial: Cancer diagnostic facilities and detection centers, J.A.M.A., 138:132, Sept. 11, 1948.

5. Kirklin, B. R., and Hodgson, J. R.: Cancer of the stomach: its incidence and detection, Am. J. Roent. & Rad. Ther., 60:600, Nov. 1948.

6. Levin, M. L.: See Ackerman and del Regato, Ref. 1, p. 23.

7. Michigan Cancer Detection Center Survey: J. Mich. S. Med. Soc., 48:441, April 1949.

8. Sante, L. R.: Discussion of Small Film Screening of Major Cities by T. F. Hilbish: Rad., 52:251, Feb. 1949.

9. Willis, R. A.: The Pathology of Tumors. C. V. Mosby, St. Louis, 1948.

Physiologic Basis of Nasal Operations

A. C. Hilding, M.D., *Duluth, Minnestota*

SUMMARY

To be successful, intranasal operations must be so designed as to restore the normal physiologic function of the nose. It is impossible with impunity to operate upon the interior of the nose as though it were simply an air flue and on the sinuses as though they were boxes.

As the object of nasal operations is to restore, as far as possible, normal physiologic conditions within the nose, an understanding of the physiology of the nose is a prerequisite of such procedures. Unfortunately, some phases of nasal physiology remain unknown. However, if that which is known were applied, the results of nasal operations would be better.

Major functions of the nose include: (a) serving the sense of smell, (b) furnishing a passage for the air on its way to the lungs, (c) conditioning the air for reception in the lungs by warming, moistening and cleansing, (d) destroying bacteria and possible viruses, and (e) acting in a self-cleansing capacity. All of these functions must be borne in mind by the the surgeon, so that, for example, when he must restore an air passage mechanically, it will be done in such a way as not to hamper self-cleansing or impair humidification.

EXTERNAL NOSE

Deviations of the external nasal pyramid may be such that they result in obstruction within the nose. When such obstruction is present, the cause can frequently be demonstrated with ease. The plastic procedure for the relief of the condition entails a bilateral osteotomy and replacement of the nasal pyramid in the midline. When this is done, often some adjustment in the septum must be made.

The bridge of the nose is subject to deformities in the form of humps, which are usually symptom-free, and saddle depressions, which may be productive of symptoms. Some rhinoplastic surgeons claim that breathing is often improved in cases of saddle depressions by the insertion of a graft along the bridge of the nose.

Operations to correct deformities of the lobule of the nose are largely for cosmetic purposes and need not be discussed, except to state that every effort should be made to preserve the cartilages and other structures in a condition as nearly physiologic as possible.

Deformities of the nostrils and alae are more commonly of importance. Embarrassment of inspiration may result from anterior nares which are too small, too narrow or placed in an improper plane, as well as from alae which are too thin and soft so that they collapse easily. If the nostrils are too small, because of thickening of the alae or columella, this can be remedied by removal of portions of these structures. If the columella is to be thinned down, an incision can be made just within the vestibule on one side, parallel with the margin of the columella, and enough of the fibrous tissue within the columella removed to reduce its thickness considerably and thus increase the size of the anterior nares. Sometimes it is necessary to remove a portion of the medial crus of the alar cartilage. Alae which are too thick may be made thinner by making two incisions parallel with the lateral margin of the nostril, and removing the wedge of tissue between them.

When the tip of the nose is long and pendulous, the plane of the anterior nares may be such as to direct the jet of inspired air too high and too far anteriorly. Although this may not be of great importance, it may be corrected easily by a plastic procedure shortening the nose.

VESTIBULE

There is a valve-like action in the vestibule of the nose during inspiration which is thought by some to be the most important nasal function. The width of the vestibule, during quiet respiration, remains about the same on inspiration as on expiration; but, in forced inspiration, the upper portion of the vestibule (limen nasi) sinks in toward the septum in such a way as to cut down the flow of inspired air, thus increasing the negative pressure within the chest. During this action the upper lateral cartilage sinks in toward the septum at the same time that the upper margin of the alar cartilage, with which it is connected by an aponeurosis, tips medially and inferiorly.

The resistance produced by this valve action to inspired air Foman* believes is necessary for the normal growth and development of the face and chest. If a child is a habitual mouth breather, and lacks this resistance, the facial bones become deformed, the nose narrowed, the hard palate rises

---

Presented before the Section on Eye, Ear, Nose and Throat at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

*Foman, S.: Personal communication.

high and the chest is apt to be malformed. Resistance to inspired air increases negative pressure in the tract behind the vestibule and increases the negative pressure within the thorax. Foman states that the negative pressure during inspiration aids in bringing the blood down from the vena cava into the right heart and also aids in the pulmonary circulation. This is conceivable, since the valves in the veins hold the column of blood against the expiratory positive pressure. Often, on inspection of the vestibule, the septum is found to be too wide between the two limina nasi, and, during forced inspiration, the lateral wall of the vestibule collapses against the septum, obstructing the inspiratory air flow and causing considerable inconvenience to the patient. In these circumstances, the septum in the vestibule must be reduced in thickness. There are often thickened bony and cartilaginous ridges in this portion of the septum; removal of these, together with thinning down of the septum, often promotes easier respiration, simply because the vestibules have been widened. However, it must be borne in mind that a certain amount of resistance is normal and the aim of the operation should not be to make the vestibule as wide as possible but to give sufficient space so that the resistance is not abnormally great.

SEPTUM

The ideal septum has usually been considered to be one which is straight, thin, and lying exactly in the midline. The ordinary submucous operation is designed to make such a septum. However, the normal septum is by no means always perfectly straight, nor is it uniformly thin. The quadrilateral cartilage is normally much thicker than the perpendicular palate of the ethmoid and there is often a more or less normal ridge on the lower portion of the septum, which follows the line of the vomer bone. The cartilaginous portion of the septum is frequently slightly deviated toward one side or the other. A septum should not be judged to be abnormal just because certain irregularities can be seen in it. Frequently, when a test is made, the air will be found to flow smoothly and freely and breathing will be perfectly normal and equal on both sides. If this is the case, operation is not indicated.

Presumably, the purpose of the septum is to keep the flow of air through the nose smooth, and, at the same time, by virtue of the swell bodies contained in it, to control the width of the air passages. Often, when a septum is deflected toward one side or the other, there is a compensatory enlargement of the middle turbinate on the side of the concavity. A submucous resection on such a septum could disturb a nose which is otherwise functioning well, creating an obstruction on the side of the enlarged turbinate by bringing the septum too close to the turbinate. Surgical correction is necessary for a badly warped or deflected septum which is producing obstruction on either side. The operation selected will depend upon the deformity. If the entire quadrilateral cartilage is involved, it is desirable to do a more or less complete submucous resection of the cartilage and often of the vomer and the perpendicular plate of the ethmoid as well. If the deformity is confined entirely to the cartilage, it is not necessary to disturb the bony portions of the septum. Sometimes practically the entire cartilage, including the antero-inferior margin in the columella, must be removed. Such extensive removal is liable to result in saddle deformity of the bridge of the nose, or in retraction of the columella, or both. This is due to contracture of the sheet-like scars which form between the two flaps, rather than to loss of support of the bridge, as was taught in the past. Such contractures can be largely obviated by the insertion of cartilaginous grafts between the flaps. When the scar tissue then contracts, the force of the pull is exerted against the cartilaginous grafts and not against the bridge of the nose.

The tendency during the past 25 or 30 years has been to do a complete submucous resection for practically any type of septal deformity. Recently, in septal surgery, there has seemingly been a tendency toward a degree of the conservatism which 30 years ago saw rhinological surgeons sawing off spurs and ridges which were obstructing the nasal passages, rather than doing complete submucous resections. This was good as far as it went and constituted an attempt to restore the normal air passage. However, it was often inadequate because the septum itself was usually warped and buckled. If the septal deflection is due to dislocation of the inferior margin of the cartilage, so that it overrides the bony ridge on either side, it can be restored to normal position by means of reduction of the deformity rather than a complete submucous resection. Such operations are correct in principle in that they restore the normal physiologic condition of the nose, but they must be adequately performed.

Sometimes the antero-inferior margin of the septum is deflected in such a way that it obstructs the vestibule on one side, making it necessary to remove the lower portion of the septal cartilage. Drooping of the tip of the nose may result on account of subsequent scar contraction unless a cartilaginous graft, or strut, is placed within the columella in such a way as to resist the scar contracture and prevent drooping of the tip.

TURBINATES

The turbinates are important physiologic structures, acting both as radiators of heat and as humidifiers. Removal or destruction of large portions of the turbinates results in a dry nose and a great deal of chronic difficulty. A generation ago there were much more extensive operations done upon turbinates than at present. Most rhinologists now seem to understand well that the physiologic function of the turbinates cannot be destroyed with impunity, and operations have become much more conservative.

It is possible for the turbinates to lie too close to the septum, interfering with the inspiratory air flow, or too close to the lateral wall, hindering sinus drainage, under certain inflammatory conditions. Either of these abnormalities may be remedied by fracturing the turbinate in the required direction. This is a minor operation and does not disturb the physiology of the nose.

Partial resection of an extremely hypertrophic turbinate may be justified, but even this must be done with caution because sometimes a turbinate may be enlarged to compensate for a deflection in the septum. Often these turbinates contain an air cell, which is usually normal and should not be disturbed unless the turbinate is actually causing obstruction.

In dealing with the turbinates these two principles should be kept in mind: (1) the channels through which the incoming air flows are normally narrow and the surgeon must avoid making them too wide; (2) the air flow should be maintained in normal channels and should not be shunted into portions of the nose where the mucous membrane is unaccustomed to the force of the inspiratory air blast—for instance, in the meatuses.

The author did a series of experiments on rabbits and dogs quite a number of years ago which indicated that severe injury may be done to delicate mucous membranes if they are abnormally exposed to the drying action of inspired air. For example, in rabbits, by closing one nostril surgically, the character of the mucous membrane can be altered on both sides. On the open side, where double the normal volume of air passes, the mucous membrane tends to become squamous-like. On the closed side, certain other pronounced changes take place. It does not necessarily follow that the same thing would happen in man. In congenital atresia of the choanae, the nasal mucosa has been found to be nearly normal. On the other hand, most experienced rhinologists have seen the distressing drying and crusting which follow extensive removal of turbinates. It is prudent not to deflect air flow into the meatuses, against the ostia of the sinuses or into the sinuses themselves.

The turbinates should be preserved intact as far as possible. Sometimes they can be reduced in size by treatment with cautery. The hypertrophy of a turbinate which is enlarged for its full length can be reduced by passing a diathermy knife along the entire length of the turbinate, parallel with the inferior margin. It should be passed fully down to the bone in order that resulting scar tissue may extend from the surface to the bone, and, as it contracts, cause a corresponding reduction in the size of the hypertrophy.

SINUSES

The function of the sinuses is unknown and perhaps they have none. Proetz gives some evidence to support his view that they may be developmental accidents. Many functions have been assigned to the sinuses, but none has ever been proved, other than that each sinus is an efficient self-cleansing organ. The ciliary mechanism within it is rather elaborate and cannot be disturbed a great deal without causing pathologic changes within the sinus. Whether they have a function or not, the sinuses do exist and must be reckoned with. They do become infected at times and surgical intervention may be necessary. Because the sinus mechanism can be so easily deranged, any operation attempted should be aimed at either one of two extremes: To restore the normal physiologic conditions or to remove the organ entirely, by amputation as it were. Middle-of-the-road measures may be worse than useless.

The old concept of sinus operations seemed to be based largely on gross anatomy and the physics of gravity. The rhinologist sought drainage and ventilation. By "drainage" he meant making large holes, preferably in dependent portions of the sinus; and by "ventilation" he meant exposure of the sinus to the atmosphere. However, sinuses do not drain normally by gravity nor are they normally exposed to the air. The normal air exchange through the ostium of the sinus is minute and the normal drainage passes through the ostium without reference to gravity. The ostium may be located in the highest portion of the sinus. Hence operations done in accord with the former concept often led to the formation of bands, folds and rings of scar tissue which interfered with drainage; sometimes such scars formed pockets which then became infected. Windows, which were made for drainage, often closed and effective drainage was made impossible. Meanwhile the patient suffered from continuous discharge, and the condition after operation was frequently worse than before.

EXPERIMENTAL WORK

The author did some experiments designed to demonstrate the results of surgical interference with the sinuses. In one series on the frontal sinuses of dogs, the mucous membrane at the ostium was partially removed, leaving a ring of denuded bone. This resulted almost invariably in complete closure of the ostium, thus cutting off the sinus from the nose and indicating that the surgical procedure of enlarging an ostium by curettement is wrong in principle. In other experiments, the removal of strips of mucous membrane from curved surfaces within the sinuses resulted in crescentic scars which interfered more or less seriously with drainage. Such scars might easily result from curetting of sinuses, without complete removal of the mucous membrane, and they could interfere with drainage even though they did not close the sinus or even narrow it appreciably. If these scars merely lay transversely across the line of ciliary streaming, they might interfere with drainage and cause accumulation of secretion.

Another series of experiments, designed to study the causes of closure of surgical windows, was done on the septum between the two frontal sinuses in dogs. It was found that the window would often close if its margins were left remaining as a ring of denuded bone. However, if the operation was done in such a way that the mucous membrane was conserved on both sides and brought together across the denuded margin of bone, then the window would remain patent, with a minimal amount of contracture. Continuing the same line of thought, other experiments were done in which a ring of mucous membrane was removed from the complete circumference of the interior of the frontal sinuses of dogs. The bone was not injured in any way. Such denuded bands resulted in the building up of stenotic scars, which, in some instances, became so extreme as to form a complete wall dividing the sinuses into two portions. It has been taught that the closure of a surgical channel from the nose into the frontal sinus is due to collapse of soft parts and that if there were rigid bone on all sides of the channel, it would not close because it could not collapse. In the light of these experiments, this teaching would seem to be in error because closure can occur no matter how rigid the walls may be.

Further experiments were made on the maxillary sinus of the rabbit. In this animal the sinus lies conveniently close to the nasal wall for its full length, and it is possible to make a window between the nose and the sinus at various positions with reference to the ostium. A window can be made far from the ostium, or very close to it, or it can be made to include the ostium. The bone is extremely thin in this wall and it is easy to make the window stay open. It was found that windows made far from the ostium did not greatly disturb the normal physiology of the sinus and the sinus remained clean. However, the closer to the ostium that the window was made, the greater the disturbance which resulted. When the ostium itself was enlarged, the sinuses invariably filled with secretion which became infected. If the window were made midway between what might be called the fundus of the sinus and the ostium, an interesting phenomenon resulted. That portion of the sinus lying distal to the window would become filled with secretion and might become infected, whereas the rest of it, which had the ostium available for drainage, remained clean. The drainage mechanism of the sinus is deranged not only by an obstructing or stenotic scar, but, in some cases, merely by interrupting the continuity of ciliary flow. In such instances it was noted that the mucus which drained from the distal portion of the sinus was carried to the window margin by ciliary action and there it stopped, even though the distance across the margin of the window to normally active ciliary drainage in the nasal space was only a millimeter.

Another group of experiments was done on the dog to study the result of complete removal of the mucous membrane from the sinus with the exception of that lining the ostium. Many of these sinuses became almost completely obliterated and filled with scar tissue. Some became partially restored by mucous membrane growing in from the ostium. In these, the drainage seemed good and the sinuses remained clean. Invariably there were cysts in the scar tissue which formed and it was thought that the mucous membrane had not been cleanly removed from the bone. Undoubtedly, this was the cause in some instances, but in others the cysts were found at some distance from the bone, deeply buried within the scar tissue, leading one to speculate whether perhaps these were transplants of mucous membrane accidentally lost during the manipulation.

A few rabbits were operated upon to test the possibility of transplanting sinus mucosa. Some epithelium (mucoperiosteum) removed from the maxillary sinus was placed into drill holes in the skull in the region of the occiput. Cysts resulted from these transplants which looked very much like those found in the scar tissue in the frontal sinus in the dogs. The cysts were filled with mucus and lined by ciliated epithelium. The ciliary streaming in some of the cysts found in dogs was very active.

It can be seen from these experiments that the sinuses cannot, with impunity, be treated surgically without reference to their physiology. It is not to be expected that large holes made in sinus walls, without regard for the specific mechanism involved, will remain open and drain the sinus freely ever after. Denuded areas of bone will become covered with scar tissue, which may interfere a great deal with nasal drainage and physiology. The scars will take form depending upon the size and shape of the surface on which they develop.

PRINCIPLES OF SINUS OPERATIONS

The four principles in sinus operations, as laid down by Proetz,* have as their objective: (1) the preservation of the sinus as a functioning organ, (2) the preservation of the ostium, (3) the protection of the ostium from direct blasts of air and (4) the protection of the cavity itself from air flow. To these might be added the two principles of (a) making drainage windows as far from the ostium as possible and (b) leaving no wide ring-like areas of denuded bone around the drainage channels.

The antrum window, as usually made in inferior meatuses, follows these principles rather well. The sinus remains as a functioning organ. The ostium is untouched and both the ostium and the interior of the cavity remain protected from air blasts. The window is far enough from the ostium so that it does not interrupt ciliary streaming materially. When the window is made, it will stay open if the opening in the bone is cut a little larger than that in the mucous membrane, on both the nasal and sinal sides, thus allowing the mucous membranes on the two sides to meet over the bone.

Proetz has designed a window into the sphenoid sinus which follows these principles. The mucous membrane over the rostrum is incised close to the septum, then a vertical window is made through the bone into the sinus, extending from the thick bone above to the thick bone below, at the floor, and as close to the septum as possible. Such a window will remain open if the mucous membrane covers the denuded bony margin fairly well. It is some distance from the ostium, it does not interfere with the normal drainage, and the sinus can be readily irrigated.

---

*Proetz, A. W.: Personal communication.

The most difficult problem is encountered in making a drainage opening into a closed frontal sinus. Sometimes this may not be possible. The author has treated two patients for a mucocele of the frontal sinus which eroded through the floor into the orbit, causing a marked proptosis and downward displacement of the eyeball. In both of these cases, the cysts were some little distance away from the closest intranasal point. Both patients were successfully operated upon by carefully preserving the mucous membrane from the frontal sinus and from the ethmoids which were encountered, as well as from the nose. The bony trabeculae were removed and a bony channel formed, which was then lined by shaping into it the bits of mucous membrane which had been saved. In one instance the bits of mucous membrane were simply packed into position, and in the other they were sutured together as in a rhinodacryocystostomy. The result was excellent in both. The problem is much more difficult, of course, if suppuration is present. It may then be necessary to amputate the sinus, as it were, by removing the entire lining. If this is undertaken, then all mucous membrane must be completely removed in order that no infected pockets or cysts may remain. However, the ostium should be preserved to drain any portion of the sinus which might reform.

There has been some advocacy for the use of skin grafts to line the surgical channel between the nose and the frontal sinus, but this would seem to be entirely unphysiologic because the skin and respiratory mucosa are different tissues and one would not expect that they could be used interchangeably.

Medical Arts Building.

CAUTION

The "Huggins" or "H.M.J." Test for Cancer

Numerous articles have appeared in the public press, magazines, and advertisements from commercial firms under the title "Simple Blood Test for Early Cancer Diagnosis."

These articles are premature. The test referred to is still in the laboratory phase and is not intended for routine use, or as an office procedure. Physicians are warned against accepting reports on this "simple test" as evidence of presence or absence of cancer.

The test is based upon thermal coagulation of serum proteins and is variously referred to as either the "Huggins" or "H.M.J." test.

David A. Wood, M.D., *Secretary*
California Medical Association Cancer Commission

Dihydrogenated Alkaloids of Ergot in Treatment of Peripheral Vascular Diseases

ROY J. POPKIN, M.D., *Los Angeles*

SUMMARY

The dihydrogenated alkaloids of ergot, dihydroergocornine (DHO 180) and an equal mixture of dihydroergocornine, dihydroergocristine and dihydroergokryptine known as CCK 179 have been found to be therapeutic adjuncts in the medical treatment of peripheral vascular diseases. Their action is primarily that of adrenergic blockage, although depression of the brain stem is to be considered.

The mixture of alkaloids (CCK 179) was found to be more effective than a single alkaloid, dihydroergocornine (DHO 180). A greater number of patients were benefited, relief of symptoms was greater and the dosage easier to establish. A favorable therapeutic response of clinical significance with the mixture was obtained in approximately 60 per cent of all cases investigated. It was of greater benefit in the organic occlusive diseases, where a larger percentage of favorable responses was obtained than in the purely vasospastic disorders.

Orally and subcutaneously, CCK 179 exhibited vasodilating properties which compared favorably with paravertebral and peripheral nerve block, reflex heat, alcohol and sympathectomy. Surface temperatures were elevated, oscillometric readings increased and tolerance to cold increased in a statistically significant number of cases. Effects of sympathectomies were frequently enhanced. Following subcutaneous administration, increased surface temperatures of the extremities of one to two hours' duration were obtained in 90 per cent of all cases.

Paresthesias, nocturnal cramps and intermittent claudication were improved. A sense of well-being was occasionally exhibited.

Blood pressure and pulse rates were rarely affected. Blood pressure was lowered in normotensive patients, but was rarely changed in hypertensive patients.

Symptoms of overdosage appeared after two to three months of continuous therapy. These were manifested by lowered surface temperatures, decreased tolerance to cold, return of intermittent claudication and occasionally by vague general discomfort. These symptoms disappeared on cessation of therapy. Improvement frequently followed. In only one case was there an immediate reaction. Following subcutaneous administration of CCK, blood pressure and pulse rate increased and oscillometric readings and surface temperatures decreased.

Frequent courses of therapy with interruptions were necessary for maintenance of improvement.

THE development of a therapeutically effective chemical vasodilator in chronic peripheral vascular diseases has been one of the goals of workers in the field. Several new vasodilating compounds, adrenolytic, sympatholytic and ganglionic blocking have been reported recently.[9] Nickerson[15] in a classical paper discussed the pharmacological activity of many of these compounds. He referred to their activity as adrenergic blockade.

The primary requirement of an acceptable agent is the inhibition of normal and pathological vasoconstriction in an affected extremity with the establishment of an enlarged arterial and capillary bed. Generalized vasodilatation of the entire vascular bed is to be specifically avoided. Ease of administration, sustained action, lack of toxic or unpleasant side-effects and a high degree of therapeutic effectiveness are additional necessary requirements.

It is the purpose of this presentation to report on the therapeutic value of certain dihydrogenated alkaloids of ergot[*16] which appear to have a beneficial clinical action in peripheral vascular diseases. The exact action of these drugs is in doubt. Some investigators[3, 4, 8, 16] state that these dihydrogenated alkaloids (DH compounds) of ergot have, in man, two important synergistic actions, namely, (1) a manifest central nervous system effect of inhibition of sympathetic activity and therefore the reduction of vessel tone, and (2) a latent peripheral sympatholytic effect. Nickerson[15] questions the interpreta-

---

From the Department of Peripheral Vascular Diseases, Cedars of Lebanon Hospital, Los Angeles.

[*] Supplied through the courtesy of Sandoz Chemical Works, Inc., New York City, New York.

tion offered by these investigators of their observed results. He states that there is absence of evidence of significant adrenergic blockade and that the mechanism involved is depression of the brain stem rather than inhibition of responses to sympathetic nerve activity.

HISTORICAL BACKGROUND

The use of ergot in medicine dates back for centuries. It was known early to midwives for its oxytocic properties. Dale[6] in 1906 was the first to recognize two active principles in ergot: (1) A direct stimulating action on smooth muscles, and (2) the inhibition of sympathetic activity. Rothlin[16] showed that hydrogenation of various ergot alkaloids reduced their toxicity considerably. He found that, following hydrogenation, the ergotamine and ergotoxin groups showed a great increase in sympatholytic activity with little or no vasoconstrictive tendency. The clinical application of these alkaloids in the treatment of peripheral vascular diseases has been recent. Clinical improvement of patients has been observed by some investigators.[7, 12, 13] Laboratory studies using the plethysmograph and surface temperature determinations have shown peripheral vasodilating activity.[4, 5, 11, 17] Hafkenschiel and co-workers[10] found that the abnormal resistance to blood flow in the hypertensive brain was reduced by dihydroergocornine. These studies have all been made with single dihydrogenated ergot alkaloids, chiefly dihydroergocornine.

METHOD AND MATERIALS

The following hydrogenated alkaloids were investigated: Dihydroergocornine (DHO 180), dihydroergocristine (DCS 90) and dihydroergokryptine (DKH 135). Dihydroergocornine alone was studied initially. It was administered orally over a period of three to nine months to 45 patients. Later a combination of the three alkaloids was used. This combination was known as CCK 179. It was administered orally, subcutaneously and intra-arterially. The DHO 180 contained 1 mg. of active substance per cc.; the CCK 179 for oral administration contained 1 mg. of mixture of the three alkaloids in equal amounts (0.33 mg. per cc. of each), and the parenteral solution contained 0.3 mg. of mixture (0.1 mg. of each alkaloid) per cc. The oral solutions were tasteless and colorless. A transient burning sensation was present on subcutaneous injection.

Sixty patients were treated for from two to nine months with CCK 179. All types of peripheral vascular disorders were included in both studies. Most of the patients were started on 4 minims four times a day, and the dose was increased by 1 to 4 minims daily depending on the surface temperature rise. The majority required 4 to 6 minims per dose for maximal cutaneous dilatation. All subjects were tested under practically similar conditions. Subjects were rested in the recumbent position for 45 minutes to one hour with the extremities bare. The majority of patients were ambulatory; a few were hospitalized. All other medication and therapeutic procedures were discontinued several weeks before starting this investigation except where specifically noted. A few patients continued to smoke. Those that discontinued smoking stopped a minimum of three months prior to the beginning of this study.

Surface temperatures, oscillometric readings, blood pressure, pulse rate, skin color, perspiration and respiration were recorded. Subjective symptoms were elicited. Electrocardiograms and eyeground studies were made on a few of the patients before and during therapy. Recordings under basal conditions were made in all cases. At least three weeks of observation was carried out before therapy was instituted. The great majority of the patients had been observed for many months and years. Frequent examinations were made before and during the investigation; patients were checked a minimum of eight times during a period of three months. Subcutaneous administration of CCK was frequently combined with oral administration.

All cases were chronic. None of the patients were improving prior to therapy. Many were regressing. Placebos were frequently used. Comparisons were made with results obtained with other vasodilating procedures such as posterior tibial and paravertebral sympathetic nerve blocks, tetraethylammonium chloride, reflex heat, alcohol and sedation.

The results of the investigation of dihydroergocornine (DHO 180) are listed in Table 1. The results of the investigation of the CCK mixture of alkaloids are listed in Table 2. Many of the patients were included in both studies.

TABLE 1.—*Patients Given Dihydroergocornine (DHO 180) Orally*

ARTERIOSCLEROSIS OBLITERANS: 25 patients, 15 males, 10 females, ages 55 to 76. Diabetes mellitus was associated in 9, hypertension in 4. Favorable results were obtained in 12.

VASOSPASTIC DISORDERS (Raynaud's disease and Raynaud's phenomenon associated with scleroderma, menopausal syndrome and hereditary cold fingers): 14 patients, 11 females and 3 males, ages 19 to 71. Improvement in 2.

THROMBOANGIITIS OBLITERANS: 5 patients, all males, ages 44 to 55. Improvement in 4.

EMBOLIC OCCLUSION: Arterial, popliteal, chronic, 1 patient, female, age 44. No improvement.

TOTAL: 45 patients. Favorable response in 18 (40 per cent).

TABLE 2.—*Patients Given CCK 179 Mixture, Orally and Parenterally*

ARTERIOSCLEROSIS OBLITERANS: 36 patients, 27 males, 9 females, ages 55 to 76. Diabetes associated in 10, hypertension in 4. Improvement in 26.

THROMBOANGIITIS OBLITERANS: 8 patients, all males, ages 40 to 55. Improvement in 7.

VASOSPASTIC DISORDERS (Raynaud's disease, Raynaud's syndrome associated with scleroderma, menopausal syndrome, trauma, scalenus anticus, cervical peri-arthritis and livedo reticularis): 16 patients, 15 females, 1 male, ages 19 to 53. Improvement in 4 cases.

TOTAL: 60 patients. Favorable response in 37 (60 per cent).

OBSERVATIONS AND RESULTS

The DH alkaloids were well tolerated. The CCK mixture was not only effective in a greater number of cases than dihydroergocornine (DHO 180), but the favorable clinical response in each case was more pronounced. The optimum dose of DHO 180 was difficult to establish and maintain. Individual variations were frequent. Although CCK dosage was fairly fixed—four to eight minims (0.25 mg. to 0.50 mg. of active substance) four times daily—the duration of therapy was likewise subject to considerable individual variation. With oral medication, approximately one to three weeks of administration was necessary for favorable clinical improvement to appear. The majority required about ten weeks of therapy. Beyond this, favorable effects appeared to diminish. This observation has been confirmed by others.[14] During the course of treatment, improvement was maintained and continued for two to four weeks following complete cessation of treatment. Patients felt better if the dosage was gradually reduced over a period of days rather than suddenly stopped. Frequent courses of approximately ten weeks' duration with intervening rest periods of two to four weeks gave the best results.

Effect on Surface Temperatures and Cold Protection. With dihydroergocornine, surface temperature rises with increased cold protection were obtained in 18 out of 45 cases. With CCK orally, a favorable response was obtained in 30 of 60 patients. The surface temperatures of the extremities were increased up to the 90 to 95° F. range with fair to good cold protection provided in the patients responding. Patients stated their extremities not only warmed up more quickly but remained warmer especially at night. The temperature rise was confined primarily to the extremities. With the temperature rise, the skin color became pink. No temperature rises were obtained in smokers. Temperature rises were not maintained consistently. There were occasional periods of fluctuation. These were of short duration and the reduction in temperature was never great.

Intermittent Claudication. Dihydroergocornine was ineffective. CCK orally resulted in a favorable response in 12 of 27 patients with arteriosclerosis obliterans and six of eight patients with thromboangiitis obliterans. The majority of these patients responding stated that although in walking they were forced to halt approximately the same number of times as prior to medication for the first block or two, after the third or fourth block they could go up to a mile with no discomfort during or after the walk. The pace was increased for these patients.

Healing of Ulcerations. CCK was of benefit in the healing of ischemic ulcers in five cases. These ulcerations were of long standing with absolutely no signs of improvement. Within ten days of CCK administration, evidences of healing were apparent. Progress was rapid thereafter. No new therapy was introduced other than the CCK. There was no benefit in seven cases. Dihydroergocornine was found to be of no value in this respect.

Blood Pressure. Normotensive patients frequently showed a slight but sustained drop of 5 to 10 mm. of mercury in both systolic and diastolic blood pressure on oral medication of CCK. Hypertensive patients did not respond. Dihydroergocornine did not alter pressures significantly.

Oscillometer Determinations. The amplitude of pulsations was increased with CCK in a few cases in which cutaneous dilatation occurred. In some cases, in spite of considerable surface temperature rise, oscillometer readings remained unchanged. The maximum response was obtained in one patient with thromboangiitis obliterans in whom the increase of amplitude was over 200 per cent in all extremities.

Pulse Rate and Respiration were usually unaffected. Occasionally the pulse rate was slowed five to ten beats.

Electrocardiograms. Only a few observations were made. No significant changes were apparent.

Eyeground Studies. Pronounced dilatation of the retinal vessels appeared in a small number of cases following subcutaneous injection of CCK. However, this was not a consistent finding.

Pain. Ischemic neuritis and rest pains were rarely modified in any way.

Miscellaneous. Paresthesias and nocturnal cramps were relieved in a few patients. A pronounced sense of well-being was noted by four patients on CCK. Persistent edema of the hands was relieved in two patients on CCK. Perspiration was rarely modified.

Comparisons with Other Vasodilating Procedures. Six patients received, in addition, tetraethylammonium chloride (Etamon®) intravenously and intramuscularly during a period of hospitalization. Two patients, females, ages 22 and 24, suffering from Raynaud's disease with severe vasospastic symptoms in whom cervical sympathectomies had been done a few years previously, were unchanged regardless of therapy. One patient, a nurse aged 22, who had a scalenus anticus syndrome with vasospastic symptoms in the affected extremity, also had no response to any preparation. One patient, female, aged 60, with marked peripheral autonomic instability and severe pain and edema in the hand following a fracture of the humerus six months previously, was completely relieved with CCK orally but unaffected with Etamon. Two patients, females, ages 22 and 53, with generalized scleroderma and Raynaud's syndrome for which cervical sympathectomies had been performed a few years previously, were unaffected with Etamon and dihydroergocornine. Pronounced warming of the extremities occurred on CCK orally.

Two patients in whom paravertebral block did not elicit temperature rises responded to CCK orally. One of these two patients, a male, age 53, seven months previously had had deep laceration of the volar aspect of the left wrist which severed the tendons, nerves and arteries to the hand except for a small branch of the radial artery. The hand was shiny, cyanotic, icy cold and edematous. Function was limited. Following a cervical block, Horner's syndrome developed, the extremity became hot and dry to the wrist, but the hand and fingers were unchanged. CCK subcutaneously on two occasions was followed by an increase in temperature of the fingers and the development of a normal pink color. The temperature of the thumb rose to the 90-95° F. range but that in the other fingers rose only to the high 80's from a previous 70 to 75° F. range. On oral CCK only slight temperature rises were apparent, but the edema of the hand subsided completely. The other patient was a male, aged 68, who had severe arteriosclerosis obliterans with occlusion of the lower abdominal aorta. Paravertebral block revealed no temperature rise. On oral CCK, there was a temperature rise of 5 to 8° F. to the high 80's, which compared favorably with the highest temperatures obtained by alcohol and reflex heat. In no case did CCK subcutaneously or orally prove as effective as a posterior tibial block in obtaining the maximum temperature rise. In the majority of cases, the rise with CCK subcutaneously was good. It was usually 2 to 3 degrees below the maximum obtained by nerve block. In only a few cases of organic occlusion was the block successful and the CCK without effect. CCK orally was found to be as effective as alcohol and reflex heat in the majority of cases studied.

Results in Sympathectomized Patients. Six patients who had had sympathectomies were given dihydroergocornine orally and CCK orally and subcutaneously. Two of the patients had Raynaud's disease and the sympathectomies had been ineffective. DH therapy was likewise ineffective. Two patients with scleroderma responded to CCK with temperature rises to 90-93° F. from previous lows of 70-80° F. Edema of the hands and fingers in one case was relieved. In one patient, a male, aged 50, with thromboangiitis obliterans, upon whom bilateral lumbar sympathectomy had been performed many years previously, no significant differences were noted with CCK. One patient, a male aged 50, with thromboangiitis obliterans had had unilateral lumbar sympathectomy two years previously. Both DH compounds were effective in raising the surface temperatures of extremities on either side. The intermittent claudication disappeared only with CCK. The surface temperatures in the lower limbs became about equal, and in the 90's, while the patient was under therapy.

CCK Mixture Subcutaneously. CCK was given by subcutaneous injection to 45 patients. In 40 patients, the temperatures of the fingers and toes rose to the 90° F. and 95° F. range, whereas previously they had been below 90° F. The increase occurred at about 45 minutes after the injection, reached a peak in 60 to 75 minutes and decreased to previous norms in 90 to 120 minutes. Color was improved. Blood pressure, pulse rate and oscillometric readings were rarely affected. All types of cases were included in this series.

Intra-arterial Therapy. CCK was administered intra-arterially on three occasions to two patients. These patients had shown no response to posterior tibial block and showed no response to the intra-arterial injection.

Reactions. A reduction in surface temperature was noted in many patients during the course of therapy. Whether this was due to too large a dosage, prolonged administration of small dosage with possible accumulation, or to a counter-regulatory mechanism could not be determined. Reducing the dosage or cessation for several days to two weeks brought on a return of the increased surface temperatures. One patient, a female, aged 55, who had coronary artery disease with old infarction and mild decompensation, hospitalized at the time of this study for severe arteriosclerosis obliterans and ulceration of a toe, was given 1 cc. of CCK subcutaneously. Within an hour, the temperatures of the toes and calves decreased 4 to 6° F., the blood pressure increased from 130 mm. of mercury systolic and 90 diastolic to 150 mm. systolic and 100 diastolic. The pulse rate increased from 88 to 96 and the oscillometric recordings at the wrists and ankles decreased. The hands, fingers and face became covered with perspiration. These symptoms disappeared within two hours of reaching their maximum. The patient was later treated with CCK orally and responded favorably.

DISCUSSION

The evaluation of any new therapeutic agent for chronic illness is difficult. The value of vasodilator drug therapy in the chronic peripheral vascular diseases has always been a subject of dispute. The Mayo Clinic Group,[1] in listing the pharmacologic agents recommended for peripheral vascular diseases, noted the plethora of agents and the lack of therapeutic effectiveness of the majority of them. Many drugs were found to have limited or even no value in the hands of others than the original investigator. The contributing factors modifying the course of chronic disease processes are many. In this presentation, the factors of spontaneous improvement, regression and associated therapy were considered in evaluating the results obtained. The majority of patients in this series had been under observation for periods up to ten years and the effect upon them of other therapeutic agents and procedures had been thoroughly investigated. They were all in a stationary period or getting worse; none were improving. It is felt, therefore, that in these circumstances fairly sound conclusions are permissible.

The dihydrogenated ergot alkaloids appear to act by adrenergic blockade resulting in a reduction of sympathetic tone with relaxation of the vessel wall. Nickerson's[15] explanation of depression of the brain stem must also be considered. Regardless of the mode of action, an enlarged peripheral arterial and capillary bed was demonstrated in many of the patients showing favorable clinical response. The peripheral vessels in a normal individual are in a constant state of vasoconstriction necessary for the maintenance of body temperature. This is controlled through the vasomotor centers in the medulla.[2] In a patient who has peripheral vascular disease, this function is maintained. The normal vasoconstriction superimposed upon an organic arterial occlusion aggravates the ischemic process. Reduction of this tone, therefore, will aid in increasing the capacity of the arterial bed. As vasoconstriction is normally more pronounced in the lower extremities due to the factor of posture, and as the peripheral arterial occlusive diseases are more common in the lower extremities, reduction in tone in this area should result in a favorable clinical response. Clinical observations support this. Increased tone or spasm due to organic irritation from atheromatous plaques or thrombi is an additional factor. This likewise was favorably influenced in many of the patients in the present series. It could not be determined whether this was due to a peripheral sympatholytic action or to an inhibition of the spinal sympathetic centers.

The reduction of hypertension reported by other investigators[7, 8, 11] was not found. Wide differences in the method of administration and dosage are probably the chief factors. Most of the investigators have reported on the intravenous administration of the DH alkaloids and on the large doses necessary for oral administration.

REFERENCES

1. Allen, E. V., Barker, N. W., and Hines, E. A.: Peripheral Vascular Diseases, Philadelphia, 1946, W. B. Saunders Company.

2. Best, C. H., and Taylor, H. B.: The Physiological Basis of Medical Practice, ed. 4, Baltimore, 1945, Williams & Wilkins Company.

3. Bluntschli, H. J.: Clinical observations on the sympathetic inhibitory effects of a new ergot alkaloid, South African M. J., 21:21-23, 1947.

4. Bluntschli, H. J., and Goetz, R. H.: The effect of ergot derivatives on the circulation in man with special reference to two new hydrogenated compounds (dihydroergotamine and dihydroergocornine), Am. Heart J., 35:873, 1948.

5. Bluntschli, H. J., and Goetz, R. H.: The effect of a new sympathicolytic drug (dihydroergocornine) on the blood pressure with special reference to hypertension, South African M. J., 21:382, 1947.

6. Dale, H. H.: On some physiological actions of ergot, J. Physiol., 34:163, 1906.

7. Dimtza, A.: Discussion remarks, surgery of the sympathetics, 12th Congress of the International Society of Surgery, London, 1947.

8. Freis, E. D., Stanton, J. R., and Wilkins, R. W.: The effects of certain dihydrogenated alkaloids of ergot in hypertensive patients, Am. J. Med. Sci., 216:163, 1948.

9. Grimson, K. S., Hendrix, J. P., and Reardon, M. J.: Newer adrenolytic sympatholytic, and ganglionic blocking drugs, J.A.M.A., 139:154, Jan. 15, 1949.

10. Hafkenschiel, J. H., Crumpton, C. W., Moyer, J. H., and Jeffers, W. A.: The effects of dihydroergocornine on the cerebral circulation of hypertensive and normotensive subjects, paper presented at the 22nd Scientific Session, Am. Heart Assoc., Atlantic City, June 3, 1949.

11. Hayes, D. W., Wakim, K. G., Horton, B. T., and Peters, G. A.: The effects of dihydroerogocornine on the peripheral circulation in man, Proc. Central Soc. Clin. Research, 21:47, 1948.

12. Kappert, A.: Zur Behandlung mit Intraarteriellen Injectionen, Helv. Med. Acta, 15: No. 1, 1948.

13. Lenggenhager, K.: Beobachtungen an Raynaud-Patienten, Schweiz. med. Wchnschs., 77:97-98, 1947.

14. Moister, F. C., Stanton, J. R., and Freis, E. D.: Observations on the development of tolerance during prolonged oral administration of dihydroergocornine, J. Pharmacol. and Exper. Therap., to be published.

15. Nickerson, M.: The pharmacology of adrenergic blockade, J. Pharmacol. and Exp. Therap., Part 2, 95:27-101, April 1949.

16. Rothlin, E.: The pharmacology of the natural and dihydrogenated alkaloids of ergot, Bull. schweiz. Akad. d. med. Wissensch., 2:249, 1947.

17. Wilkins, R. W., Freis, E. D., and Stanton, J. R.: Essential hypertension: Laboratory studies in human beings with drugs recently introduced, J.A.M.A., 140:261-265, May 21, 1949.

Endometriosis

WOODBURN K. LAMB, M.D., *Berkeley*

SUMMARY

The cause of endometriosis is not known. The incidence of the disease is greater than was previously suspected and it probably is increasing. Nulliparous women are more likely to have endometriosis than are women who have had children.

The commonest symptoms are lower abdominal pain, disturbance of menstruation, and dysmenorrhea, most often of the increasing or acquired type. Relative and absolute sterility are common partners of endometriosis.

A better percentage of correct preoperative diagnoses should be obtained in view of present knowledge.

Radical operation on women in the premenopausal age groups with endometriosis is resorted to in far too high a percentage of cases. The good results which can be attained with conservative therapy, including surgical and hormone therapy, should be stressed.

There is some evidence that endocrine therapy may control endometriosis. The dangers attending these methods have not as yet been determined.

THE purpose of this presentation is threefold: First, to emphasize the need of a continually thoughtful mind in diagnosing endometriosis. Second, to emphasize the importance of conservation of ovarian tissue in the premenopausal woman. Third, to review the problem as presented by a study of 153 patients operated upon in a small general hospital with a staff composed of specialists in obstetrics and gynecology, general surgeons and general practitioners.

There were 153 cases of proved endometriosis in this series taken from 2,660 cases of gynecological operations performed from January 1945 through January 1948. Thus the incidence was 5.7 per cent. This varies from some reports such as that of Meigs[13] which was based upon private practice, but agrees essentially with the percentage he reported with regard to clinic patients and also with many other reports of similar studies. In the present study many cases had to be discarded because of lack of pathological confirmation, although the clinical description was classic. This point is important. Many times implants are not removed. It is the author's opinion, and one shared by many observers, that in the class of patients studied here the reported incidence in this series is far below the actual incidence. Endometriosis is definitely or seemingly increasing. Interest and knowledge are leading to more accurate diagnosis. Meigs[13] reported with regard to patients treated by him in private practice that 35 per cent of those upon whom operation was done had endometriosis. As this percentage applies only to patients operated upon, many minor cases of this disease thus are not included. Fallon,[4] reporting on observations of patients in a clinic, said that endometriosis was more common than acute appendicitis.

The incidence in the population at large is unknown, and because of pronounced variations between reports in the present literature, it is impossible to obtain a close estimate. In a recent article Beecham[1] reported the incidence of endometriosis in 1,000 consecutive gynecological office cases as 5.8 per cent.

The early symptoms of endometriosis are vague and in many cases a biopsy to make a positive diagnosis does not seem warranted. Thus the true incidence is unknown. Suffice it to say that the disease is more prevalent than was previously suspected.

In the present study the 153 cases were divided into the common classifications (as shown in Table 1):

1. Internal, or confined to the uterus — the so-called adenomyoma.
2. External, or found in the pelvis not involving the uterus.
3. Combined, involving both uterus and pelvic or other structures.

TABLE 1.—*Incidence of Types of Endometriosis*

Type	Number	Per Cent
Internal	60	39.2
External	83	54.3
Combined	10	6.5
Total	153	100.0

The incidence of the various classifications in various age brackets is shown in Table 2. The predominance of all cases lies in the age group from 30 to 55. In analyzing this table it is observed that adenomyosis occurs in a slightly older group of individuals than does external endometriosis. The incidence as reported here shows that the predominance of cases of internal endometriosis occurs in the age group from 35 to 55, while that of external endometriosis occurs in the group from 25 to 45. This confirms data noted by other observers.

In discussing statistics gathered in study of the 153 cases in the present report, an attempt will be made to elucidate the present-day opinions and views of writers relative to symptoms, signs, diagnoses, and treatment.

As revealed in the statistics of Table 3, there were

Presented before the Section on Obstetrics and Gynecology at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

no specific symptoms of endometriosis. Ordinarily there was pain in the area involved, but even this was not constant. Dysmenorrhea was noted in 28.8 per cent of the patients in this series, as shown in Table 4. This was ordinarily of the increasing type. This figure corresponds well with that reported by Meigs[13]—26.4 per cent. Fallas and Rosenblum[3] in a study of a similar nature reported an incidence of 43.4 per cent. The reported incidence of dysmenorrhea varies, depending upon the accuracy with which records are kept, but all observers record it as high. In the present series it will be noted that dysmenorrhea was more often associated with external than with internal endometriosis. This agrees with data reported by Fallas and Rosenblum and other observers.

Although dyspareunia is a symptom often associated with endometriosis, this is not revealed by the average record. It has been noted by the author and reported by others that close questioning of patients elicits information showing that the incidence is much higher than would be indicated in the perusal of hospital records. Endometrial nodules in the posterior cul-de-sac are most often painful to pressure.

TABLE 2.—*Age of Incidence by Type of Endometriosis*

	TYPE OF DISEASE					
	INTERNAL		EXTERNAL		COMBINED	
Age	No. Cases	Per Cent	No. Cases	Per Cent	No. Cases	Per Cent
15-19..	0	0	0	0	0	0
20-24..	0	0	8	9.6	0	0
25-29..	1	1.7	11	13.3	0	0
30-34..	2	3.3	22	26.5 }80.8%	0	0
35-39..	13	21.7	16	19.3	3	30
40-44..	11	18.3 }85%	18	21.7	3	30 }90%
45-49..	15	25.0	7	8.4	1	10
50-54..	12	20.0	1	1.2	2	20
55-59..	4	6.7	0	0	1	10
60-64..	2	3.3	0	0	0	0
65-69..	0	0	0	0	0	0

TABLE 3.—*Symptoms of Endometriosis*

	Type of Disease				
Complaint	Internal	External	Combined	Total	Per Cent
Menorrhagia	23	16	4	43	28.1
Metrorrhagia	12	10	1	23	15.0
Polymenorrhea	0	1	0	1	.65
Uterine hemorrhage	2	0	2	4	2.6
Dysmenorrhea	13	31	0	44	28.8
Lower abdominal pain	13	47	6	66	43.1
Backache	15	10	2	27	17.7
Abdominal tumor (noted by patient)	2	7	1	10	6.5
Vaginal discharge	6	7	1	14	9.1
Bladder symptoms	10	2	0	12	7.8
Rectal pain	0	2	0	2	1.3
Menopausal bleeding	5	0	0	5	3.3
Gastrointestinal upsets	0	1	1	2	1.3
Dyspareunia	0	6	1	7	4.6
Sterility	3	10	0	13	8.5
General menopausal symptoms	6	3	1	10	6.5
Chronic abortion	0	1	0	1	.65
Pain in legs	3	1	0	4	2.6

TABLE 4.—*Incidence of Dysmenorrhea in Endometriosis*

Type	No. of Patients	No. with Dysmenorrhea	Per Cent
Internal	60	13	21.7
External	83	31	37.4
Combined	10	0	0
	—	—	—
Total	153	44	28.8

Symptoms of bladder involvement are usually, as reported by Henriksen[6] and McDougal and Deur,[11] frequency and dysuria occurring prior to the menses and continuing through it.

The other symptoms noted may be explained by associated pathological conditions in the particular organ involved, as shown in Table 5. Here it is noted that fibroids of the uterus occurred in 29.4 per cent of cases. Other observers have noted a somewhat higher incidence of this associated condition: Fallas and Rosenblum,[3] 41.5 per cent; Novak[14] 33.7 per cent. The most common associated pathological conditions were found in the ovary; the highest in incidence were simple follicular cysts—30.7 per cent. Thus, rather high incidence of endometrial hyperplasia might have been expected. The high incidence of associated pathologic change in the ovary undoubtedly partially explains the high percentage of irregular and profuse bleeding previously noted under symptomatology. Unfortunately, there was no specific report on the endometrium in most of these records. Novak and Alves de Lima[14] recently reported a study relative to the incidence of changes in the ectopic endometrium as compared to the uterine endometrium. They reported endometrial hyperplasia in 23.4 per cent of the cases studied.

The high incidence of hyperplasia and perhaps anovulatory cycles may be a partial explanation of the relative sterility noted in patients with endometriosis.

In Table 6 the incidence of involvement of organs is shown, and the data agree in general with the findings in studies by others with regard to the average anatomical locations of endometriosis.

TABLE 5.—*Associated Pathologic Conditions*

	Type of Disease				
	Internal	External	Combined	Total	Per Cent
	Number of Cases				
Fibroid uterus	23	21	1	45	29.4
Ovarian disease:					
Simple follicular cysts	17	27	3	47	30.7
Lutein cysts	4	4	1	9	5.9
Multilocular cystadenoma	0	2	0	2	1.3
Hemorrhagic cysts (not chocolate)	6	10	1	17	11.1
Carcinoma ovary	0	0	1	1	.65
Dermoid cysts	1	0	0	1	.65
Fibromas ovary	0	1	0	1	.65
Chronic pelvic inflammatory disease	5	18	1	24	15.7
Endometrial hyperplasia	8	5	2	15	9.8
Chronic appendicitis	3	8	1	12	7.8
Acute appendicitis	1	0	1	2	1.3
Endometrial polyp	1	6	1	8	5.2
Cervical polyp	0	1	0	1	.65
Pregnancy, intra-uterine	1	0	0	1	.65
Carcinoma, body uterus	2	0	0	2	1.3
Uterus bicornis unicollis	0	2?	0	2	1.3
Chronic cervicitis	19	10	3	32	20.9
Endometritis	0	0	1	1	.65

There were no cases of the rare locations (such as arm, leg, or pleura) noted in the records of the 153 cases here reported upon.

DIAGNOSIS

The early diagnosis of endometriosis within the pelvis or abdominal cavity presents one of the most difficult problems in gynecology.

The history is particularly important, and awareness of the high incidence of the lesion should be borne in mind. Endometriosis usually produces pain of one kind or another. Dysmenorrhea of the acquired type is of particular importance. Pyrexia associated with pain occurring at the time of the menses is important. Jeffcoat[9] demonstrated that in 10 per cent of patients observed by him pyrexia was an important factor in making the diagnosis. This occurs during the menses, the temperature not ordinarily going above 102° F., and disappearing one to two days after the flow ceases. This might possibly confuse the differential diagnosis in ruling out pelvic inflammatory disease.

Ovulatory charts thus become of dual importance. The incidence of anovulatory menstruation in adenomyosis is particularly high. Spatt[15] reported 72 per cent in carefully studied cases.

The history of previous abdominal operations becomes of increasing importance in light of the high incidence of endometriosis, in this series, among patients who had had operations. As shown in Table 7, 49 per cent of the 153 patients in the series had undergone previous abdominal operations, and 33 per cent had had operation involving incision of the genital tissue. These figures are almost in exact accord with those from the Mayo Clinic presented by Counseller.[2]

In Table 8 it will be noted that in the present series 15.7 per cent of cases were correctly diagnosed preoperatively. This contrasts with 6.8 per cent reported (ten years ago) by Fallas and Rosenblum.[3] Perhaps this is encouraging, as it would tend to show that gradually physicians are becoming more cognizant of this condition. There were, however, only 38.6 per cent diagnosed at the surgical table, which is about in line, in this respect, with the figures reported by Fallas and Rosenblum. Perhaps this indicates that surgeons are not looking for or are not familiar with the gross lesion of endometriosis.

At present there is no specific hormonal index or guide available in establishing or indicating the diagnosis. There are a few instrumental aids in the diagnosis of pelvic endometriosis, namely:

1. The vaginal speculum, which may show the typical dark-bluish dome cyst becoming visible through the mucous membrane.
2. The cystoscope, which is of aid in the diagnosis of vesical endometriosis.
3. The culdoscope, which Te Linde has shown to be a potent aid in the hands of a competent observer.

The proctoscope is of little aid in making a diagnosis of endometriosis involving the bowel.

TABLE 6.—*Involvement of Organs*

Organ	No. of Cases	Per Cent of Cases
Uterus	70	45.7
One ovary	63	41.2
Both ovaries	19	12.4
Pelvic peritoneum	27	17.8
Bladder	3	2.0
Sigmoid	7	4.6
Fallopian tube	5	3.3
Rectum	2	1.3
Small intestine	2	1.3
Round ligament	3	2.0
Uterosacral ligament	6	3.9
Cecum	1	.65
Infundibulopelvic ligament	2	1.3
Umbilicus	1	.65
Cervix	1	.65
Broad ligament	8	5.2

TABLE 7.—*Previous Abdominal Operations*

Type	No. of Patients	No. with Previous Laparotomy	Per Cent	No. with Genitals Incised	Per Cent
Internal	60	37	61.6	27	45.0
External	83	35	42.2	23	27.7
Combined	10	3	30.0	1	10.0
Total	153	75	49.0	51	33.3

TABLE 8.—*Record of Diagnosis in 153 Cases of Endometriosis*

	No.	Per Cent
Diagnosed preoperatively	20	13.1
Suspected preoperatively	4	2.6
Diagnosed at operation	52	34.0
Suspected at operation	7	4.6
Diagnosis by pathologist only	70	45.8

The finding, on physical examination, of rather firm, irregular, nodular, and "shotty" feeling tissue behind the cervix, which is unusually sensitive, in conjunction with the history remains one of the best clues to pelvic endometriosis. The nodules in the uterosacral ligaments can usually be best identified by rectal-vaginal examination. Where the lesion is more extensive, involving the ovaries and broad ligaments, a similar nodular process may be felt, often in conjunction with fixation, and a small cystic tumor may be palpated.

Fixed retroversion of the uterus should always arouse suspicion of endometriosis. Due to the lack of notation in case records no accurate data relative to the position of the uterus and associated endometriosis could be obtained. This is a serious error and might have been a factor in the failures of diagnosis noted in this report.

Testosterone may be used as an aid in the presumptive diagnosis of endometriosis. It will often suppress the symptoms with alleviation of pain and many times cause temporary regression of the palpable nodules and cysts. The author uses this reaction in conjunction with the history, examination, and other factors, to establish a diagnosis.

The diagnosis, then, rests on: (1) Carefully taken history; (2) Adequate and careful pelvic examination; (3) Visualization wherever possible, and biopsy of tissue; (4) Suppression of symptoms when testosterone is given.

As the recognition of endometrial implants in the peritoneal cavity is familiar to anyone now doing abdominal and pelvic operations, this apparently is not a problem. What is important, however, is the necessity of searching for the smaller implants, biopsy if they are found, and destruction of them when possible. This must be stressed, for although endometriosis is not always an advancing disease, it is usually so in the presence of active ovarian tissue. As endometriosis usually develops slowly, recognition of it, with determination by biopsy, is important with regard to the patient's future.

Another symptom of endometriosis which alone brings the patient to the physician for examination is relative or absolute sterility. In this series the records indicated that this was the primary problem in only 26 cases or 16.9 per cent, but in many cases it was an incidental observation. Of 143 married patients, 69 had reproduced and 74 had not (Table 9). These statistics are in agreement with many reports; Counseller[2] noted almost the same division.

TREATMENT

Those physicians who are most cognizant of the problems involved in complete castration of the female are in accord on at least one phase of the subject—namely, that ovarian conservation is necessary wherever possible. This is emphasized by Beecham,[1] Meigs,[13] Counseller[2] and others. Castration in the female should be given as much consideration as castration in the male. Every attempt should be made to conserve the vital function of the ovary and its influence on emotional and physiological balance. In this series, as can readily be seen, this factor was not given that consideration. In this respect there is little variance in these statistics with those presented in many other studies of the past. However, this is no excuse for continuation of ill-considered castration in the reproductive age groups.

Table 9.—*Marital and Parity Status of Patients*

	Internal Only	External Only	Combined	Total
Married (parous)	34	31	4	69
Married (nulliparous)	25	44	5	74
Unmarried	1	8	1	10

Table 10.—*Type of Operation Employed*

Type	No. Cases	Conserv.	Per Cent	Radical	Per Cent
Internal	60	40	66.6	20	33.3
External	83	56	67.4	27	32.6
Combined ..	10	5	50.0	5	50.0
Total......	153	101	66.0	52	33.9

As shown in Table 10, radical operations were done in 34 per cent of the 153 cases in the present series, a far higher figure than is justified in the light of present knowledge. There was a high incidence of radical operation in patients of all the age groups (Table 11), and it was particularly high in the younger patients for whom the most conservative of operations would seem to be indicated. For patients past the average age of menopause, the retention of ovarian tissue is not of great importance, and in the presence of extensive endometriotic lesions, complete oophorectomy should be done.

It is impossible at present to determine rules of procedure in the treatment of endometriosis. Perhaps nowhere in medicine is the judgment of the physician more taxed in determining the right answer relative to the patient's future well-being. In the presence of certain specific lesions, the answer may be more specific, depending entirely on the extent of the lesion. Often more than one organ is involved. In determining procedure in a specific case, the following points must be considered:

1. The degree of endometriosis present and the organs involved.
2. The age of the patient.
3. The desires of the patient relative to pregnancy, and also in regard to production of an artificial menopause. Many women who are given a complete understanding will gladly risk future operation or intensive glandular therapy rather than have castration immediately.
4. The emotional status of the patient.
5. Severity of the symptoms.
6. The need for immediate exploration. Often the diagnosis is not exact and the physician may be suddenly confronted with signs of obstruction, hemorrhage, possibilities of acute appendicitis, rupture of a viscus, twisted pedicle cyst, etc. In such circumstances there may be no question about the need for immediate operation. However, all the above points

Table 11.—*Operations in the Various Age Groups*

	Type of Disease									
	Internal		External		Combined		Total			
Age	Conserv.	Radical	Conserv.	Radical	Conserv.	Radical	Conserv.	Per Cent	Rad.	Per Cent
20-24....................	0	0	6	1	0	0	6	85.7	1	14.3
25-29....................	0	1	13	0	0	0	13	92.8	1	7.2
30-34....................	0	1	16	6	0	0	16	69.6	7	30.4
35-39....................	10	4	11	4	0	3	21	65.6	11	34.4
40-44....................	9	2	8	11	3	0	20	60.6	13	39.4
45-49....................	9	6	1	5	1	0	11	50.0	11	50.0
50-54....................	10	2	1	0	1	1	12	80.0	3	20.0
55-59....................	1	3	0	0	0	1	1	20.0	4	80.0
60-64....................	1	1	0	0	0	0	1	50.0	1	50.0
Total................	40	20	56	27	5	5	101	66.0	52	34.0

must be kept in mind when the actual lesion is determined to be endometriosis.

Simple endometrial cysts of the ovary often can be shelled out easily and the major portion of the functioning ovary preserved. This is done routinely by many physicians, including the author. It is no guarantee against further growth, but in many cases it is in itself sufficient.

Adenomyosis in women near the menopause is best treated by hysterectomy. In younger women, unless the lesion is of major extent, presacral sympathectomy will most often relieve severe dysmenorrhea. Presacral sympathectomy is of little value in endometriosis of the combined type, particularly if the pain is ovarian. If the infundibulopelvic ligament is resected, it may relieve ovarian pain but the blood supply of the ovary is seriously affected. If retroversion of the uterus is present in younger women, it is advisable to suspend the uterus in view of the high incidence of fixation and pain, dyspareunia, and further extension of the process into the rectovaginal septum.

Serious lesions of the bowel produced by endometriosis are not common. McGuff, Dockerty, Waugh and Randall[12] observed only 16 cases producing obstruction in 20 years' experience at the Mayo Clinic. In the present series, there were 12 cases involving the bowel, an incidence of 7.85 per cent. However, in none of these cases was the bowel obstructed. If symptoms of bowel obstruction arise, however, any patient regardless of age should be operated upon as soon as practicable. The type of operation depends on factors of age, involvement, and location of the lesion.

A phenomenon which has made a tremendous impression on the author is the regression of endometriosis during pregnancy. This has been observed by the author in every carefully followed case in his own practice, and it has been noted by other observers. In many of these cases there has been little regrowth, but in time the transplants ordinarily become reactivated unless further pregnancy intervenes. There is a tremendous bombardment of the endometrial implants by estrogen during this physiological amenorrhea which seems to have a depressing effect on the growth of the aberrant tissue.

In an attempt to produce a long period of amenorrhea, Karnaky[10] has been treating patients with increasingly potent doses of diethyl stilbestrol. By this means, patients have been kept relatively amenorrheic for a period of several months. Karnaky reported almost complete regression of endometrial transplants in all patients so treated. This sounds feasible in view of the physiological results often associated with pregnancy, and if it is borne out in further experience it offers hope such as no other method to date can equal. Thus far the author has not had sufficient experience with this method to draw a conclusion, but patients being treated by this method are now under observation.

Hurxthall and Arnold[7] reported that three patients with endometriosis were treated successfully with moderately large doses of diethyl stilbestrol. They believed the basis of relief was suppression of progesterone. Misgivings were expressed regarding the long-term effect of estrogenic stimulation over a long period. Two of the patients were reported on after 18 and 24 months of continuous diethyl stilbestrol therapy.[8] Endometrial biopsies indicated endometrium of hypoplastic type. As a result of these reports, this method of approach to the problem of endometriosis bears intensive study.

The use of testosterone in many cases offers a real aid in controlling the regrowth of ectopic endometrium following conservative operation. It should be kept in the armamentarium of the physician for use when necessary. Testosterone should also be kept in mind for use in controlling the symptoms of artificial menopause in younger patients who have been subjected to radical operation with castration and attending sequelae.

Greenblatt[5] reported very successful results in experience with pellet implantations of testosterone, intramuscular testosterone propionate and methyl testosterone by mouth in the treatment of endometriosis. The author has had no experience with pellet implantations, but oral and intramuscular use has often given dramatic relief.

No trials of hormone therapy were reported in the case records of the patients studied in this series.

2434 Durant Avenue.

REFERENCES

1. Beecham, C. T.: Surgical treatment of endometriosis, J.A.M.A., 139:971, April 9, 1949.

2. Counseller, V. S.: The surgical aspects of endometriosis, J. Internat. Coll. Surgeons, 11:29, Jan.-Feb., 1948.

3. Fallas, R., and Rosenblum, G.: Endometriosis, A. J. Ob. & Gyn., 39:964-975, June 1940.

4. Fallon, J., et al.: Endometriosis; Two hundred cases considered from the viewpoint of the practitioner, New England J. M., 235:669-673, Nov. 7, 1946.

5. Greenblatt, R. B., and Suran, R. R.: The conservative management of endometriosis, Surg. Clin. N. A., 29:583, 1949.

6. Henriksen, E.: Primary endometriosis of the bladder, J.A.M.A., 104:1401, April 20, 1935.

7. Hurxthal, L. M., and Arnold, W. T.: Conservative treatment for endometriosis with diethyl stilbestrol: Report of the cases, Lahey Cl. Bull., 6:38, 1948.

8. Idem: The effects of prolonged diethyl stilbestrol upon the endometrium, Lahey Cl. Bull., 6:80, 1949.

9. Jeffcoate, T. N. A.: Pyrexia as a sign of endometriosis, J. Ob. & Gyn. Brit. Emp., 54:855-860, December 1947.

10. Karnaky, K. J.: The use of Des stilbestrol for endometriosis, preliminary report, So. M. J., 41:1109, 1948.

11. McDougall, T. G., and Deur, S. J.: Vesical endometriosis, W. J. S. & G., 57:107, March 1949.

12. McGuff, P., Dockerty, M. B., Waugh, J. M., and Randall, L. M.: Endometriosis as a cause of intestinal obstruction, S. G. & O., 86:273-288, March 1948.

13. Meigs, J. V.: Endometriosis, Annals of Surgery, 127: 795-807, May 1948.

14. Novak, E., and Alves De Lima, O.: A correlative study of adenomyosis and pelvic endometriosis, with special reference to the hormonal reaction of ectopic endometrium, A. J. Ob. & Gyn., 56:634, November 1948.

15. Spatt, S. D.: Andenomyosis of the uterus—A study of 52 reported cases and review of the literature, A. J. Ob. & Gyn., 52:581, 1946.

CASE REPORTS

- Endocarditis Lenta Due to Staphylococcus Aureus
- Allergic Reaction to Decholin Used in Circulation Test
- Streptomycin in Tuberculous Meningitis with Emphasis on the Toxicity of Streptomycin

Endocarditis Lenta Due to Staphylococcus Aureus

Report of a Case

James H. Thompson, M.D., *San Francisco*

THIS report of a single case of staphylococcus aureus endocarditis with penicillin treatment and clinical arrest is made in view of certain difficulties involved in the diagnosis and because of the mild afebrile course.

The only similar case found in the literature was one reported by MacNeal,[2] in which a patient with staphylococcus aureus endocarditis had low-grade fever, never over 100° F. except on one occasion after reaction to penicillin. In that case the patient had intermittent courses of treatment with penicillin over a period of several months. The amount of penicillin given, which was governed by the amount then (1944) available, ranged from 500 units to 10,000 units every two hours. The patient was finally "cured" when the article was published a year later.

In their section on bacterial endocarditis in "Oxford Medicine," Libman and Friedberg[1] stated that "staphylococcus aureus has been reported as the cause of subacute bacterial endocarditis, but we have no confirmatory experience." They go on to discuss "mild cases of bacterial endocarditis," but they do not mention staphylococcus aureus as an etiological agent.

The patient in the present case had mild bacterial endocarditis. With regard to this case, however, "lenta" is considered a more exact word than "mild," because "lenta" implies a slow course. Before the advent of antibiotics, almost all bacterial endocarditis was fatal and it was difficult to convince members of a family that the patient had "mild endocarditis" when in the next breath it was explained that the outcome was likely to be fatal. On the other hand, it seems reasonable that "slow" endocarditis can terminate fatally.

CASE REPORT

A 72-year-old man was admitted to Franklin Hospital, San Francisco, on March 3, 1946, complaining of generalized arthralgia and weakness of one year's duration. He had been well until about one year before admission, at which time he noted the onset of "severe low-back pain" which had been attributed by a physician to a recent attack of "flu." The pain gradually increased and spread throughout the spine. About ten months prior to admission the patient began to lose weight, and the pain spread to the limbs. It became so severe that the patient was unable to dress himself.

About seven months prior to admission the hemoglobin value was found to be 60 per cent. Iron, liver extract, and blood transfusions did not relieve the anemia. On admission to Franklin Hospital, the complaints were severe generalized pain in the back, made worse by motion, and severe pain in both arms, both shoulders, and both wrists. The pain was so severe as to interfere with sleep, and the patient was hardly able to get about his room. Any activity made the pain worse. There had been a loss of about 40 pounds in weight in ten months. The patient said he had not had chills or fever.

Past History: In childhood the patient had had Osgood-Schlatter disease. About 30 years before the present illness he had had "blood poisoning" of the left hand, followed by a "continuous siege of boils for several years." About 25 years ago "severely infected" tonsils had been removed, and this seemed to "cure the boils." Twenty years ago cholelithiasis had developed and cholecystectomy was done. About ten years ago the patient had noted angina pectoris on exertion and was told his blood pressure was "250." He had never noted edema or orthopnea, and he said that so far as he knew he had not had rheumatic fever. His first knowledge of cardiac murmur was about one year ago.

Physical Examination: The patient was well-developed but underweight. The general appearance was in accord with the stated age of 72. The patient was in extreme distress and did not seem comfortable in any position. There was a generalized *cafe au lait* tint to the skin, more pronounced over the chest. Several small pigmented moles were observed but no petechiae or other rash was noted. There was no apparent focus of infection. The chest was emphysematous with a few coarse, moist rales at both bases. The heart sounds were distant. A high-pitched, rough systolic murmur was heard over the whole precordium. This murmur was loudest at the apex and was transmitted to the axilla but not to the back. A soft, blowing systolic murmur was heard in the aortic area. The abdomen was slightly distended and tympanitic. The liver edge was 7 cm. below the right costal margin and was firm, smooth, and non-tender. The tip of the spleen was 4 cm. below the left costal margin; its edge was rounded, hard, and non-tender. The fingers were cyanotic and clubbed, but no splinter hemorrhages were seen. The reflexes were equal and active throughout. Otherwise, the physical examination was essentially normal.

Laboratory Work: There was a slight trace of albumin but no erythrocytes in the urine. The hemoglobin content in the blood was the equivalent of 10 gm. per 100 cc. Erythrocytes numbered 4,030,000 and leukocytes 6,200, with 60 per cent polymorphonuclear cells, 35 per cent lymphocytes, 4 per cent monocytes, and 1 per cent basophils. Results of Wassermann and Kahn tests were negative for syphilis. Total blood protein content was 8.21 gm. per 100 cc.

An electrocardiogram showed a pulse rate of 82, with normal rhythm and occasional premature beats; the P-R interval was 0.16 second; and the QRS interval was 0.08 second; T3 was diphasic.

Clinical Instructor in Medicine, University of California Medical School, San Francisco 22, California.

Blood cultures revealed the following: March 3, 1946: Positive for staphylococcus aureus.

March 7, 1946: Positive for staphylococcus aureus.

March 8, 1946: Positive for staphylococcus aureus. Plate count showed 25 colonies per cc. The organisms were sensitive to penicillin.

March 10, 1946: Positive for staphylococcus aureus.

March 15, 20, 25, and 30, 1946: Negative.

April 10, 20, and 30, 1946: Negative.

Treatment consisted of penicillin, 20,000 units every two hours, from March 10 to March 19, 1946. Then, from March 19 to April 17, 1946, 25,000 units was given every three hours. The total was 7,960,000 units in about five weeks.

Throughout a six-week stay in the hospital the patient was afebrile. The pulse rate ranged from 90 to 100 per minute, and respirations from 20 to 24 per minute.

By June 1946, three months after treatment was started, the patient had regained about two-thirds of the weight he had lost and was almost completely relieved of "arthritic pains." He had returned to his office where he worked several hours each day.

Now, three years later, the patient is working in his office ten to twelve hours daily. There has been no change in the cardiac murmur and no evidence of congestive failure. The "arthritic pains" are gone and blood cultures have shown no growths.

DISCUSSION

In this case an interesting problem of diagnosis was presented. The patient was seen in consultation primarily because of anemia which was believed to be the cause of weakness. The enlarged spleen gave an important clue which, added to the findings of clubbed fingers, *cafe au lait* pigmentation, and cardiac murmur, caused endocarditis to be considered. It was surprising to find staphylococcus aureus as the offending organism, but repeated studies confirmed this finding. It is interesting to speculate as to the date of onset of septicemia, for it may well have started with the onset of the "arthritis" a year before. The fact that the "arthritic pains" ceased following treatment suggests that they were related to the septicemia. Afebrile staphylococcus-aureus septicemia of any duration is extremely rare. The relatively small doses of penicillin given appear to have been adequate. However, in light of recent experience, larger doses probably would be given now in similar circumstances.

SUMMARY

A case of afebrile staphylococcus-aureus endocarditis lenta with penicillin treatment and clinical arrest of three years is reported. Only one similar case has been reported in the literature. The importance of blood cultures, even in the absence of fever, is again demonstrated.

REFERENCES

1. Libman, E., and Friedberg, C. F.: Subacute bacterial endocarditis, Oxford Medicine (Oxford University Press), Vol. II, page 346.

2. MacNeal, W. J., Poindexter, C. A., and Martey, F. N.: Apparent arrest of staphylococcal endocarditis, Am. Heart. J., 29:403-408, March 1945.

Allergic Reaction to Decholin Used in Circulation Test

Report of a Case

Edward Suckle, M.D., *Los Angeles*

The value of the circulation time as an aid in the determination of the presence of congestive heart failure has been well established.[2, 4] Decholin® (sodium dehydrocholate) was introduced into medicine for this purpose in 1931 by Winternitz.[5] Other compounds such as calcium gluconate have been used for the same purpose but the latter has a synergistic action with digitalis and is potentially toxic when used in digitalized patients. Decholin, on the other hand, is relatively non-toxic and the only contraindications to its use as stated in a brochure prepared by the manufacturer* are: (1) obstructive jaundice, (2) bronchial asthma.

Untoward reactions to Decholin are rare. A search of the American literature reveals only a report by Norman[3] in 1947 of three cases in which allergic reactions occurred subsequent to the injection of Decholin. In none of these cases was there a clear-cut history of previous allergic disease. In one case there was no reaction to the first injection of Decholin but a second injection one week later was followed by shock. In another case, injection was followed in one minute by a violent asthmatic attack. (In this instance, a review of the clinical findings suggests that the dyspnea was probably due to unrecognized asthmatic bronchitis.) In the third case, widespread diffuse urticaria developed five minutes after the injection of Decholin.

The following case report is submitted as the fourth case in which frank allergic manifestations occurred following the parenteral use of Decholin.

CASE REPORT

The patient, a 52-year-old white woman, was first observed April 12, 1949, for evaluation of hemoptysis. X-ray films of the chest made at this time revealed healed apical pulmonary tuberculosis ("fibrocalcific scarring but no evidence of active parenchymal disease"), bilateral basal bronchiectasis, and generalized pulmonary emphysema. A study of the sputa on several occasions did not reveal Koch's bacilli. There had been previous attacks of hemoptysis in 1918, 1938, and 1942. There was no record of previous allergic manifestation. In 1942 the patient had had a "heart attack," characterized by substernal oppression in the xiphoid area and pain along the left anterior costal margin with pronounced tachycardia. Electrocardiograms made during this attack were not available but an electrocardiogram made during the present study revealed a left bundle branch block. Slight left ventricular enlargement was noted in an x-ray film of the chest. The amount of bloody sputum decreased sharply during a six-day stay in the hospital, and the patient was discharged April 18, 1949.

In order to decrease the amount of purulent sputum, inhalations of penicillin dust were taken at home, but after several days a local sensitization developed in the form of a sore throat.

On May 16, 1949, the patient complained of dyspnea on recumbency, together with headache. Both symptoms were relieved only by sitting up repeatedly during the night. Physical examination revealed the lungs to be clear. The heart findings included a soft systolic murmur which was Grade 2 at the apex and was transmitted to the axilla. The systolic murmur was Grade 1 at the base. The aortic second sound was not accentuated. The rhythm was regular. The blood pressure was 155 mm. of mercury systolic and 95 mm. diastolic. The liver was not enlarged. No edema of the lower extremities was discernible nor was there visible distention of the peripheral veins of the extremities.

---

* Ames, Inc., Elkhart, Ind.

Because of the symptoms of left ventricular failure, it was decided to determine the circulation time, and 3.0 cc. of Decholin (sodium dehydrocholate 20 per cent solution) was injected into the antecubital vein of the left arm. The circulation time was found to be 15 seconds. Five minutes later the patient began to complain of a strange sensation on the anterior chest wall. Examination revealed pronounced erythema of the upper anterior chest wall and flushing of the face. Soon afterward wheals typical of urticaria appeared in the erythematous area of the chest, and the patient complained of itching. A few moist rales were noted in the bases of both lungs. Hypodermic injection of two minims of epinephrine hydrochloride 1:1,000 and the oral administration of 50 mg. of pyribenzamine abated the symptoms. There were no sequelae to this attack.

DISCUSSION

The case herein reported corresponds, in character of allergic manifestations, with one of the cases reported by Norman.[3] In neither case was there history of allergic reaction, but the patient in the case herein reported had allergic response to penicillin dust a few weeks before Decholin was given. Allergic sensitivity to drugs, whether given orally or parenterally, has long been observed. It has been noted with respect to heavy metal salts such as arsenic, mercury, bismuth and gold, such synthetic compounds as acetylsalicylic acid, aminopyrine and barbiturates, and tissue extracts such as insulin and liver extract. The explanation of allergic reaction to drugs was recently summarized by Feinberg,[1] who stated that: "The simple chemical substance per se is incapable of acting as an antigen, but in combination with body substances, particularly proteins, it becomes a perfect antigen capable of producing the allergic manifestation. This concept explains the failure of most drugs to cause skin test reactions and explains the absence of circulatory antibodies."

SUMMARY

Allergic manifestations in the form of urticaria and erythema were noted in a patient who was given Decholin® parenterally to determine circulation time. Only three such cases have been reported previously.

3307 West 43rd Place.

REFERENCES

1. Feinberg, S. M.: Allergy in Practice. Chicago, The Year Book Publishers, 1946.

2. Hitzig, W. Y.: Value of circulation times, Mod. Concepts of Cardiovas. Dis., Vol. 16, August 1947.

3. Norman, J. K.: Reactions to Decholin in circulation time determination, Am. Heart J., 34:740, November 1947.

4. Tarr, L., Oppenheimer, B. S., and Sager, R. V.: The circulation time in various clinical conditions determined by use of sodium dehydrocholate, Am. Heart J., 8:766, August 1933.

5. Winternitz, M., Deutsch, J., and Brull, Z.: Eine Klinisch brauchbare Bestimmungsmethode der Blutemlaufszeit mittels Decholinjeckktion, Med. Klin., 27:986, 1931.

Streptomycin in Tuberculous Meningitis with Emphasis on the Toxicity of Streptomycin

Report of a Case

DANIEL J. VRACIN, M.D., *Downey*

ON March 27, 1947, a four-year-old white girl was admitted to Duke Hospital (Durham, N. C.) with a history of convulsions, fever, and vomiting of 16 days' duration.

History: When the child was one and one-half years old the parents noted that she held her back rather rigid. She walked with short, mincing steps, and had a moderate amount of difficulty in getting off the floor. The child was very irritable. She frequently cried out when asleep, and perspired profusely at night. A spinal deformity became noticeable in September 1946. Roentgenograms revealed necrosis of the ninth and tenth thoracic vertebrae. A diagnosis of Potts' disease was made. A nursemaid who had cared for the child most of her life was found to have pulmonary tuberculosis. The patient underwent a spinal fusion of the ninth, tenth, and eleventh thoracic vertebrae in October 1946.

March 11, 1947, the patient had fever and complained of headache and nausea. She vomited frequently and became delirious. March 18 she had a generalized convulsion lasting four hours. The following day the only residual effect was ptosis of the right eyelid. Streptomycin (150 mg. every three hours) was given for eight days, and the patient was then transferred to Duke Hospital for further study and treatment.

The patient, who appeared to be well nourished, was apathetic and seemed to be chronically ill. The temperature was 38.5° C.; pulse rate was 104; respirations were 28 per minute; blood pressure was 104 mm. of mercury systolic and 80 mm. diastolic. Hearing was intact. The external auditory canals were clear, the tympanic membranes were intact, and there was no evidence of middle ear infection. There was ptosis of the right upper eyelid. The right pupil was larger than the left; both reacted to light and accommodation. Fundoscopic examination revealed blurring of both optic discs. The extraocular movements were performed without difficulty. There was slight nuchal rigidity. Chest examination was negative. The abdomen was soft and no organs or masses were palpable. Neither Babinski's nor Kernig's sign was unequivocally present. The tendon reflexes were hypoactive. The superficial reflexes were present. There was no localized muscular weakness and no paralysis.

Leukocytes in the blood numbered 10,300 per cu. mm. with normal differential of cells. Hemoglobin content was 13.2 gm. per 100 cc. The urine was normal and results of serologic tests were negative. There were 123 cells in the clear spinal fluid, with mononuclear cells predominant. Reaction to a Pandy's test was 1+. No organisms were found on smear of the fluid and no pellicle formed in 24 hours. Routine and tuberculin cultures showed no growth. Spinal fluid proteins were 142 mg. per 100 cc.; chlorides 680 mg. per 100 cc.; and dextrose 40 mg. per 100 cc. Reaction to tuberculin skin test was positive 1:10,000. The Weltmann coagulation reaction was zero. Roentgenograms of the lungs were read as normal. The films of the vertebral column showed loss of calcium. There was evidence of destruction of the ninth, tenth, and eleventh thoracic vertebrae without paravertebral swelling. Films of the skull were normal.

The diagnosis was tuberculous meningitis.

Intensive streptomycin therapy was given over a period of 38 days. A total of 3.20 gm. was given intrathecally, and 80.95 gm. intramuscularly. The intramuscular dose was 350 mg. every three hours. The patient complained of pain and tenderness at the sites of injection. The intrathecal dose was started at 50 mg. and increased slowly to 200 mg. This dose was not tolerated. The patient became delirious and vomited. Nystagmus and vertigo were evident. The dosage was lowered to 100 mg. for the duration of the therapy. On the 20th day of treatment the patient had a generalized clonic convulsion. She had five such episodes during the next four days. The fever persisted during the entire course of treatment. On the 32nd day of therapy the intramuscular streptomycin was discontinued and the convulsions stopped. When

Table 1.

A. Local reactions: (1) irritation, (2) paresthesia.

B. Neurological manifestations: (1) headache, (2) nausea and vomiting, (3) somnolence, (4) nystagmus, (5) vertigo, (6) tinnitus, (7) ataxia, (8) partial or complete deafness, 9) increase in spinal fluid cell count.

C. Allergic reactions: (1) urticaria with or without pruritus, (2) fever, (3) purpura, (4) skin eruptions, (5) nausea and vomiting, (6) eosinophilia, (7) leukopenia.

D. Kidney: (1) cylindruria, (2) casts (granular, hyaline, cellular), (3) albuminuria, (4) hematuria, (5) urinary retention.

E. Miscellaneous: (1) hypotension, (2) synovitis.

treatment was resumed on the 36th day, the convulsions returned accompanied by a maculopapular eruption. With final cessation of therapy, the rash disappeared, and there was no recurrence of convulsions. The patient became more rational and began taking an interest in toys. Examination at that time revealed impaired hearing. During the next four days the deafness became complete.

On the 53rd hospital day the patient, then in excellent condition, was discharged to the care of the family physician.

Two years after discharge the family physician reported that the patient was getting along nicely and her activity was normal for a child of her age. However, the deafness was still present.

DISCUSSION

Since the discovery of streptomycin in 1944, there have been numerous reports on its toxicity. It is difficult to ascertain how much of the reactions are caused by impurities and how much by streptomycin alone.

Table 1 is a list of toxic manifestations that was made up from reports in the recent literature.

In this case report, the convulsions that occurred during the course of therapy are attributed to the streptomycin. This was proven when the drug was discontinued and the convulsions ceased. With the resumption of therapy, the convulsions recurred. In this case the manifestations of toxic reaction encountered were fever, local irritation, maculopapular rash, lethargy, coma, convulsions, vertigo, nystagmus, complete deafness, nausea and vomiting, and eosinophilia.

Leary Clinic.

SUMMARY

Successful treatment of tuberculous meningitis with streptomycin is reported.

The toxic manifestations reported in the literature have been listed.

Symptoms of intoxication noted in the case reported are discussed.

REFERENCES

1. Bertoye, P., and Lanternier, J.: Tuberculous meningitis and streptomycin, Revue Mensuelle de Pediatrie, p. 451, July-August 1948.

2. Brown, H. A., and Hinshaw, H. C.: Toxic reaction of streptomycin on the eighth cranial nerve apparatus, Proc. Staff Meet. Mayo Clinic, 21:347, Sept. 4, 1946.

3. Farrington, R. F., Hull-Smith, H., Bunn, P. A., and McDermott, W.: Streptomycin toxicity, J.A.M.A., 134:679-688, June 21, 1947.

4. Fowler, E. P., and Seligman, E.: Otic complications of streptomycin therapy, J.A.M.A., 133:87, Jan. 11, 1947.

5. Hinshaw, H. C., and Feldman, W. H.: Treatment of tuberculosis with streptomycin, J.A.M.A., 132:778-782, Nov. 30, 1946.

6. Madigan, D. G.: Clinical and pharmaceutical aspects of toxicity of streptomycin, Lancet, 1:9-10, Jan. 4, 1947.

7. Martino Casamayor, J.: A case of tuberculous meningitis cured by streptomycin instramuscularly, Boletin del Instituto de Patologic Medica, 3:155, August 1948.

8. National Research Council, Committee on Chemotherapeutics and Other Agents, C. S. Keefer, Chairman: Streptomycin in the treatment of infections: Report of 1,000 cases, J.A.M.A., 132:4, Sept. 7, 1946; 70, Sept. 14, 1946.

9. Nau, O. S., Jr., and Wenzler, F. J.: Tuberculous meningitis treated with streptomycin, Journal of Pediatrics, 32:410, April 1948.

10. Shatz, A., Bugie E., and Waksman, S. A.: Streptomycin, substance exhibiting antibiotic activity against Gram-positive and Gram-negative bacteria, Proc. Soc. Exper. Biol. and Med., 55:66-69, January 1944.

11. Smith, H. V., Vollum, R. L., and Cairns, H.: Treatment of tuberculous meningitis with streptomycin, Lancet, 254:627, April 24, 1948.

California MEDICINE

OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8 PHONE DOUGLAS 2-0062

Editor, DWIGHT L. WILBUR, M.D. *Assistant to the Editor*, ROBERT F. EDWARDS
Editorial Executive Committee
ALBERT J. SCHOLL, M.D., Los Angeles H. J. TEMPLETON, M.D., Oakland
EDGAR WAYBURN, M.D., San Francisco
For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIALS

The World Medical Association

Observers of international medical practice and students of medical economics have noted with considerable pleasure the operations of the World Medical Association. Formed in 1947, the W.M.A. consists of the national medical associations in 40 countries and expects to reach a total membership of 60 countries through new admissions.

Here is a truly professional organization of physicians, unlike the World Health Organization and UNESCO, which are supported by government funds as parts of the United Nations. The World Medical Association is supported by contributions from the medical associations in the various member nations and from individual physicians and allied organizations and other groups in these countries. It receives no governmental support and has no governmental or political strings attached to its activities and pronouncements.

Best assay of the World Medical Association comes in its own statement of its objectives, which are listed as:

1. To promote closer ties among national medical associations and doctors.
2. To maintain the honor and protect the interests of the medical profession.
3. To study and report on professional problems.
4. To organize an exchange of information on matters of interest to the medical profession.
5. To present the world medical opinion to W.H.O. and UNESCO.
6. To assist all people of the world to attain the highest possible level of health.
7. To promote world peace.

In pursuit of these objectives, the World Medical Association has instituted several studies which are now under way. These cover such subjects as the status of the medical profession of the world, the status of world medical education, postgraduate medical education and specialist training, medical advertising and nostrums, a survey of cult practice and an international code of medical ethics. These are the studies which can best be carried on by the doctors themselves, not by governmental representatives in W.H.O., who are primarily interested in public health matters. Perhaps the most significant of W.M.A.'s studies is a continuing review and summary of social security developments throughout the world with particular reference to plans of medical care.

As a young organization, W.M.A. has attracted an unusually high degree of interest and attention. Part of this springs, no doubt, from the broad fields of endeavor hinted at in the list of studies under way; possibly an even larger part comes from the very nature of the organization itself, an international federation of physicians and their own national societies. For the first time, the practicing physicians of the world can meet in an organization of their own, free of political domination, to discuss and seek solutions to international problems of mutual interest.

The American Medical Association has played an active part in the development of W.M.A. and has been honored by the election of Dr. Louis A. Bauer of New York as secretary of the association. In turn, California has been honored by the appointment of Dr. John W. Cline as one of the A.M.A. delegates to W.M.A. International headquarters are maintained in New York.

As against such an auspicious beginning and such an inspiring list of objectives and studies, it is unfortunate that W.M.A. has found financial difficulties besetting it. The constituent associations are more than willing to contribute their fair share of funds to run the organization but most of them find themselves up against national currency restrictions which prohibit their sending dollars out of their own national boundaries. The medical association in Great Britain, for instance, could not send dollars to this country as dues to W.M.A., but it could and did contribute by meeting the expenses of the November 1949 meeting in London.

Inasmuch as the United States remains the only major nation without international currency restrictions, it is incumbent on this country at present to supply the modest financing required by W.M.A. A national committee has been established for this purpose in New York and has announced as its objective the securing of 5,000 American physicians as individual members at ten dollars each per year. Such a membership would achieve the financial goal of W.M.A. and eliminate the need of soliciting funds from state and county medical societies, pharmaceutical producers, allied professional organizations and others.

California Medicine is not a fund-raising publication, but in the matter of W.M.A. it may with propriety express an attitude. Here is an organization so worthy of medical support that any support this publication can give it is gladly extended. California doctors are noteworthy for their support of sound causes in the interest of medicine and it is hoped they may accept this challenge in their customary manner of generosity. Memberships for individual physicians carry with them a subscription to the publications of W.M.A. and other valuable returns.

Membership dues may be sent direct to the World Medical Association, United States Committee, at 2 East 103rd Street, New York 29, or through the office of the California Medical Association. The cause is right, the hour ripe.

Letters to the Editor . . .

Tuberculin "Activator"

In 1927 it was shown by Rich and Lewis[3] that living tissue cultures of leukocytes from tuberculous guinea pigs are hypersensitive to tuberculin. Favour[1] and his associates of Harvard University afterwards demonstrated the same tuberculin hypersensitivity in the leukocytes of tuberculous patients. When suspended in normal human plasma, such leukocytes undergo fairly rapid lysis on the addition of a small amount of old tuberculin. Leukocytes from normal tuberculin-negative individuals, similarly suspended, resist lysis. Since lysis takes place in the presence of normal plasma, Favour concluded that it is an example of purely cellular rather than humoral allergy.

This conclusion was subsequently challenged by Miller,[2] based on his belief that the earlier tests were performed with inadequately washed leukocytes. White cells obtained from the bloods of tuberculous patients were therefore repeatedly washed in isotonic salt solution. Duplicate samples were suspended in normal human plasma and in the plasmas of tuberculous individuals. Control tests were made with the leukocytes of normal tuberculin-negative individuals.

To 0.4 cc. of such cell suspensions 0.1 cc. of dilute tuberculin was added. Total white cell counts were made immediately and after 60 minutes' incubation at 37° C. Within the limits of the experimental error no reduction in initial cell count was noted in any of the leukocytes suspended in normal tuberculin-negative plasma. Leukocytes from both normal individuals and from tuberculous patients, however, underwent from 20 to 35 per cent reduction in cell count in all tubes in which they were suspended in plasma from tuberculous individuals.

Tuberculin cytolysis thus occurs only in the presence of tuberculous serum, both normal and tuberculous leukocytes being equally susceptible to this lysis. Lysis is thus due to the adjuvant action of some specific component of tuberculous plasma. This component is non-dialyzable and is inactivated by heating to 56° C. for 15 minutes. It is precipitated with the globulin fraction of the plasma proteins.

REFERENCES

1. Favour, C. B.: Proc. Soc. Exp. Biol. and Med., 65, 269, 1947; 70, 369, 1949.

Fremont-Smith, P., and Favour, C. B.: Proc. Soc. Exp. Biol. and Med., 67, 502, 1948.

2. Miller, J. M., Favour, C. B., Wilson, B. A., and Umbarger, M. A.: Proc. Soc. Exp. Biol. and Med., 70, 738; 71, 287, 1949.

3. Rich, A. R., and Lewis, M. R.: Proc. Soc. Exp. Biol. and Med., 25, 596, 1927-28.

W. H. Manwaring, M.D.
Stanford University, Calif.

CALIFORNIA MEDICAL ASSOCIATION

R. STANLEY KNEESHAW, M.D.....President
DONALD CASS, M.D.....President-Elect
LEWIS A. ALESEN, M.D.....Speaker
DONALD A. CHARNOCK, M.D.....Vice-Speaker
SIDNEY J. SHIPMAN, M.D.....Council Chairman
L. HENRY GARLAND, M.D.....Secretary-Treasurer
H. GORDON MacLEAN, M.D.....Chairman, Executive Committee
DWIGHT L. WILBUR, M.D.....Editor
JOHN HUNTON, Executive Secretary.....General Office, 450 Sutter Street, San Francisco 8
ED CLANCY, Field Secretary......Southern California Office, 417 South Hill Street, Los Angeles 13. Phone: MAdison 8863

NOTICES AND REPORTS

Public Funds for Hospital Construction

Within the past few years both federal and state "gifts" have become available for the construction of hospital facilities. Conditions are attached to the receipt of such funds, and legal restrictions are applicable in the granting and use of this type of public subsidy.

The California Medical Association deems it advisable to review the subject of federal or state funds for hospital construction and to express certain principles which the Association submits should be observed by any organization or body considering the *use* of such funds for the construction of hospital facilities.

The following facts in regard to federal and state funds are applicable at this time, and it is upon these facts that the principles enunciated herein are based.

1. Federal funds for the 1950-1951 fiscal year available for California hospitals amount to about $5,000,000.

2. State funds available for the 1949-1950 fiscal year amount to $2,000,000. Under state law this amount may be raised to match federal funds.

3. Federal funds are allocated only after approval of the hospital construction project by the California State Department of Public Health; these funds are available to state, county, municipal or voluntary (non-profit) hospitals.

4. State funds are available only to state, county or district hospitals; a state constitutional provision prohibits the allocation of such state funds to any private institution.

5. Federal funds are available only to those hospitals whose applications have been approved by the State Department of Public Health, in accordance with a master hospital plan developed by that department for the entire state and in accordance with other regulations established for the screening of applications for funds.

6. Applications already received by the State Department of Public Health total about $100,000,000. This sum indicates that a long waiting period lies ahead of any successful applicant for state and/or federal funds in view of approximately $7,000,000 present annual total available.

7. The allocation of federal funds carries with it the observance of various restrictions, including construction requirements, availability of hospital facilities for all classes of people, and others.

8. The use of state and/or federal funds immediately opens the door to substandard practitioners who claim that the public funds allocated to the hospital constitute a public trust and who demand that they be admitted to the staff of the hospital, regardless of professional status or skill.

9. Opening of hospital staffs to substandard practitioners makes it impossible for such hospitals to maintain recognized internships, residencies or nursing schools. The lack of these services deprives the patient of the best possible care.

10. In the case of "district hospitals" the observance of state legislation relative to professional staff appointments is required. Such legislation now permits practitioners other than licensed doctors of medicine to serve on staffs of "district hospitals." Additional legislation providing an even broader basis of staff membership could be adopted at any future legislative session. In some areas, due to small or scattered population or other definite factors, resort to the "district" method of ownership may be necessary.

In view of these elements, the California Medical Association, acting through its Council, asserts its belief in the following principles, which are offered as a guide to physicians and

others who are seeking means of raising funds for hospital construction:

1. The care of the patient is the chief consideration in the building and maintenance of hospitals and the best possible care cannot possibly be given where governmental restrictions or requirements make it impossible to provide services which would otherwise be available for the good of the patient.

2. The use of state or federal funds for construction of either private or public hospitals should be discouraged. After construction, maintenance costs are continuous and can only be assured through local community support.

3. Funds for hospital construction should be raised by private subscription, by endowment or by other means which are available and which will not entail building, staff or other restrictions which operate against the good of the patient or which unduly increase the cost of construction. If hospital beds are needed in any community, a real need should be demonstrated to the citizens of the community, who in turn should respond with contributions to a community fund. The experience in Kansas proves that this method is practical.

4. In some areas where a definite need for hospital beds has been demonstrated and where community resources are insufficient to meet the cost of construction, it is recognized that public funds may need to be employed. However, such instances should be few in number and should be most carefully examined to determine the true facts of (1) need, (2) capacity to raise funds by non-governmental means, and (3) ability to maintain and operate after construction.

Change in A. M. A. By-Laws—Membership Dues

To the Secretaries of the Constitutent State and Territorial Medical Associations:

The House of Delegates of the American Medical Association at its meeting in Washington, D. C., December 6 to 8, 1949, adopted amendments to the By-Laws of the American Medical Association whereby Division One, Chapter II, Tenure of Membership, has been changed to read as follows:

CHAPTER II

Tenure and Obligations of Membership; Dues

Section 1.—When the Secretary is officially informed that a member is not in good standing in his component society he shall remove the name of said member from the membership roll. A member shall hold his membership through the constituent association in the jurisdiction of which he practices. Should he remove his practice to another jurisdiction, he shall apply for membership through the constituent association in the jurisdiction to which he has moved his practice. Unless he has transferred his membership within six months after such change of practice, the Secretary shall remove his name from the roster of members.

Section 2.—Annual dues, not to exceed $25.00, may be prescribed for the ensuing calendar year in an amount recommended by the Board of Trustees and approved by the House of Delegates. Each active member shall pay said annual dues to his constituent association for transmittal to the Secretary of the American Medical Association.

An active member who is delinquent in the payment of such dues for one year shall forfeit his active membership in the American Medical Association if he fails to pay the delinquent dues within thirty days after notice of his delinquency has been mailed by the Secretary of the American Medical Association to his last known address.

Any former member who has forfeited his membership because of being delinquent in payment of dues may be reinstated on payment of his indebtedness.

You will note that the following important changes have been made:

(A) The word "Dues" has been added to the title of Chapter II.

(B) Chapter II has been divided into two sections.

(C) The first sentence of Chapter II, which read, "Membership in this Association shall continue as long as a physician is a member of a component society of the constituent association through which he holds membership," has been deleted.

(D) The words "of the American Medical Association" have been added after the word "Secretary" where clarification is necessary.

(E) The sentence, "An active member shall pay dues or assessments as may be prescribed by the Constitution or By-Laws," has been deleted.

(F) The words "in the American Medical Association" have been added after the words "shall forfeit his active membership" in the second paragraph of Section 2.

(G) The sentence forming the third paragraph of Section 2, with regard to reinstatement, is a new addition to Chapter II.

(H) A new paragraph, forming the first paragraph of Section 2, providing for annual dues not to exceed $25.00 has been added to Chapter II.

The House of Delegates, on recommendation of the Board of Trustees, set the membership dues for the year 1950 at $25.00.

The full effect of the new provisions will have to be studied and developed during the next year. However, the following interpretations of the amended By-Laws are offered for your guidance at this time:

(a) Active membership in the American Medical Association will continue to be limited to those members of constituent associations who (1) hold the degree of Doctor of Medicine or Bachelor of Medicine, and (2) are entitled to exercise the rights of active membership in their constituent associations as provided in Article 5 of the Constitution of the American Medical Association.

(b) A member of the American Medical Association shall lose his membership in the Association when the Secretary of the American Medical Association is officially informed that a member is not in good standing in his component society *or is delinquent in the payment of the American Medical Association dues established by the above change in the By-Laws.*

(c) Forfeiture of membership in the American Medical Association due to failure to pay dues will have no effect on membership in the component or constituent medical societies unless the component or constituent societies amend their respective constitutions and by-laws. It is, therefore, possible that a physician may be a member of his component and constituent societies and at the same time not be a member of the American Medical Association.

(d) The amended By-Laws provide for the collection of the American Medical Association membership dues by the constituent associations for transmittal to the Secretary of the American Medical Association. The detailed method to be adopted by each constituent association will vary in each state. In general, the method utilized by each state for the collection of its own component and constituent association dues should be followed.

Some of the problems involved in the collection and transmittal of dues will be considered in a later communication to you.

It is planned to provide each member of the American Medical Association a membership card and certificate of membership when his dues are paid.

It will be necessary for the Secretary of the American Medical Association to notify those members who are delinquent in the payment of their dues, and this office will, therefore, require a complete list of all active dues paying members.

No changes have been made in the Constitution and By-Laws of the American Medical Association with respect to Fellowship. Eligibility for Fellowship and annual Fellowship dues of $12.00 remain the same. Under the present By-Laws a Fellow will pay for the year 1950 total membership and Fellowship dues of $37.00.

The following members may be exempted from the payment of the $25.00 American Medical Association membership dues: retired members; members who are physically disabled; interns, and those members for whom the payment of such dues would constitute a financial hardship.

No member should be exempted from the payment of his American Medical Association dues who is not exempted from his component and constituent society dues.

GEORGE F. LULL, M.D.
Secretary and General Manager
American Medical Association

Industrial Fee Schedule

Following many months of conferences, the Executive Committee of the California Medical Association has reached an agreement with the compensation insurance carriers on a schedule of fees for industrial injury cases. This schedule has been presented to the Industrial Accident Commission of the State of California, which scheduled a hearing on the proposed fee schedule for February 6, 1950.

The Council has approved and ratified the actions of the Executive Committee, a fact of which the Industrial Accident Commission has been notified.

Included in the agreement with the insurance carriers is the establishment of a continuing joint committee of the Association and the carriers, for the dual purpose of making a continuing study of the fee schedule, with a view toward periodic revisions, and of looking into alleged abuses of the industrial accident provisions by either insurance carriers or physicians. The Association's committee for this purpose will be named by the Council, the insurance committee by the carriers. Thus, for the first time since the industrial accident laws went into effect, 38 years ago, there is a continuing liaison between carriers and doctors. Much good should come from this arrangement.

As soon as the Industrial Accident Commission rules on the proposed fee schedule, the Association plans to send copies to all members.

New Postgraduate Seminar Director

Dr. C. A. Broaddus of Stockton has been appointed director of postgraduate seminars for the Committee on Postgraduate Activities, to succeed Dr. Carroll B. Andrews of Sonoma who resigned effective February 1 because of limited time available for duties outside his own practice.

The Council accepted the resignation with regret and expressed appreciation for the valuable services rendered by Dr. Andrews. He had been serving on a half-time basis since January 1948, and in that time had arranged 18 seminars throughout the state.

Dr. Broaddus, who will serve on a half-time basis with compensation of $500 a month, was appointed by the Council upon proposal by Dr. John Ruddock, chairman of the Committee on Postgraduate Activities.

The new director of seminars, a graduate of Western Reserve University Medical College and a practicing physician in Stockton since 1924, has a background of experience in arranging postgraduate programs. He was president of the San Joaquin County Medical Society in 1935 when the Stockton Postgraduate Study Club was formed and has been chairman of the club for several years. In this capacity he has been successful in bringing outstanding authorities to Stockton to address the club, which presents evening courses monthly except during the summer months. Meetings have been well attended not only by Stockton physicians but by physicians from other towns in San Joaquin and surrounding counties.

Brochure on Medical Economics

Plans are going forward for publication by the California Medical Association of a bi-monthly brochure on medical economics to be circulated among medical students, interns and resident physicians in California.

Principal purpose of the publication, plans for which have been approved by the C.M.A. Council, is to "prepare interns, residents and medical students for membership in the medical community and, more specifically, in the California Medical Association."

According to a prospectus drawn up by a special committee which was named by the President of the C.M.A. at the direction of the House of Delegates to study the matter, this will be done by publishing in the proposed brochure:

"1. Editorial and news material designed to properly indoctrinate these men in the principles of free enterprise in which we believe.

"2. Factual material concerning the economics and technique of medical practice.

"3. Light news and gossip of interest to medical students, interns and residents.

"4. An open forum in which the medical students, interns and residents may express themselves."

The committee has recommended that initially the brochure be made up of four 8½ by 11-inch pages. No date for the first issue has been set as yet.

The members of the committee which made the recommendations with regard to the brochure are: Drs. J. Lafe Ludwig, chairman, Los Angeles; Russell Lee, Palo Alto; John Graves, San Francisco; Robert Hainning, Glendale; and Justin Stein, Los Angeles.

In Memoriam

BRAMBLE, EARL G. Died in December 1949, aged 33, in an airplane accident near Banning, California. Graduate of the University of Kansas School of Medicine, Lawrence-Kansas City, 1941. Licensed in California in 1946. Dr. Bramble was a member of the Orange County Medical Society, the California Medical Association, and the American Medical Association.

✣

BURTON, JAMES WILLOUGHBY. Died in Van Nuys, December 20, 1949, aged 40. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1938. Licensed in California in 1938. Dr. Burton was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✣

DURR, SAMUEL ABRAHAM. Died in San Diego, December 4, 1949, aged 55, of a heart ailment. Graduate of Northwestern University Medical School, Chicago, 1918. Licensed in California in 1920. Dr. Durr was a retired member of the San Diego County Medical Society, and the California Medical Association.

✣

FROHMAN, BERTRAND SYDNEY. Died in December 1949, aged 55. Graduate of the College of Physicians and Surgeons of San Francisco, 1920. Licensed in California in 1920. Dr. Frohman was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

GLOOR, EUGENE EDWIN. Died in Salinas, March 18, 1949, aged 52. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1923. Licensed in California in 1923. Dr. Gloor was a member of the Santa Cruz County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

GOLDBERG, ALBERT TOBIAS. Died in Fresno, December 20, 1949, aged 43, of a coronary occlusion. Graduate of the College of Physicians and Surgeons, Los Angeles, 1921. Licensed in California in 1921. Dr. Goldberg was a member of the Fresno County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

JENNINGS, ALFRED NORMAN. Died in San Bernardino, November 30, 1949, aged 46, after an extended illness. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1935. Licensed in California in 1935. Dr. Jennings was a member of the San Bernardino County Medical Society, the California Medical Association, and the American Medical Association.

✣

JOHNSTONE, WILLIAM ARTHUR. Died in Glendale, December 8, 1949, aged 56. Graduate of the College of Medical Evangelists, 1924. Licensed in California in 1924. Dr. Johnstone was a member of the Kings County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

McGARVEY, HARRY. Died in Atascadero, November 18, 1949, aged 75. Graduate of Western Reserve University School of Medicine, Cleveland, 1897. Licensed in California in 1914. Dr. McGarvey was a member of the San Luis Obispo County Medical Society, the California Medical Association, and the American Medical Association.

✣

MARKS, SELBY HAROLD. Died in Pittsburg, December 14, 1949, aged 59, of polycythemia vera. Graduate of the University of California Medical School, Berkeley-San Francisco, 1913. Licensed in California in 1913. Dr. Marks was a member of the Contra Costa County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

MILLER, GEORGE HERBERT. Died in Sherman Oaks, December 20, 1949, aged 70. Graduate of McGill University Faculty of Medicine, Montreal, 1901. Licensed in California in 1923. Dr. Miller was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✣

SCHUSTER, EMILE GABRIEL. Died in Oakland, December 23, 1949, aged 44, of coronary thrombosis. Graduate of McGill University Faculty of Medicine, Montreal, 1940. Dr. Schuster was a member of the Alameda County Medical Association, the California Medical Association, and the American Medical Association.

✣

WOOD, FREDERICK WEBSTER. Died in Alhambra, December 20, 1949, aged 75, of a heart attack. Graduate of the Hahnemann Medical College and Hospital, Chicago, 1899. Licensed in California in 1920. Dr. Wood was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. Paul E. Dolan of Livermore was elected president of the Southern Branch of the Alameda County Medical Society at a recent meeting, succeeding Dr. H. C. Crockett of Hayward. Dr. T. A. Runyon of Castro Valley was elected secretary. The branch society, which was formed two years ago, is a part of the Alameda County Medical Society.

FRESNO

Dr. Clarmont P. Doane of Fresno was elected president of the Fresno County Medical Society at the annual meeting held in December. He succeeds Dr. William L. Adams, Jr. Others elected were: Dr. Hugh Awtrey, president-elect; Dr. Kendall B. Holmes, vice-president; Dr. Fred E. Cooley, treasurer; Drs. Neil J. Dau, J. E. Young and Henry A. Randel, delegates to the California Medical Association.

LOS ANGELES

Dr. Harold E. Pearson has been appointed head of the department of public health and preventive medicine in the University of Southern California School of Medicine. Dr. Pearson had been a member of the department of microbiology at U.S.C. since 1944.

* * *

Dr. William J. Matousek of Glendale recently was honored as the city's "physician of the year" by the Glendale Branch of the Los Angeles County Medical Association. **Dr. Ted S. Kimball**, newly elected president of the Glendale Branch, presented Dr. Matousek with a plaque inscribed: "In appreciation of his work as a physician who has contributed most to the advancement of the medical profession of Glendale in the year 1949."

Other officers of the Glendale Branch for 1950 are Dr. Gerald Beck, vice-president, and Dr. Chester Roberts, secretary-treasurer.

* * *

Dr. Chester Alcorn has been elected president of the Pomona Valley Branch of the Los Angeles County Medical Association for 1950, and Dr. Edward J. Mueller, Jr., secretary-treasurer.

* * *

California Physicians Service recently opened an account at the California Bank in Los Angeles to handle all payments for physician-members in Southern California. The greatly increased number of C.P.S. physician and beneficiary members in Southern California made possible expansion of the Los Angeles staff to handle payments directly for physicians in that area, rather than through San Francisco as in the past.

ORANGE

Officers of the Orange County Medical Association for 1950, elected at a meeting in December are: President, Dr. Ardath H. Wightman of Laguna Beach; Dr. G. Emmett Raitt, Santa Ana, vice-president; Llewellyn E. Wilson, Anaheim, secretary-treasurer. Elected as delegates to the California Medical Association were Dr. A. Norton Donaldson of Santa Ana, Dr. Charles E. Irvin, Anaheim, and Dr. G. Wendell Olson, Fullerton.

RIVERSIDE

Dr. Philip Corr of Riverside was installed as president of the Riverside County Medical Association for 1950 at a recent dinner meeting which was presided over by Dr. H. M. F. Behnemann, outgoing president. Dr. H. H. Martin became vice-president of the organization, and Dr. Cecil Lloyd, who was reelected, was installed as secretary-treasurer.

Dr. R. Stanley Kneeshaw, president of the California Medical Association, and **Dr. Dwight Murray,** a trustee of the American Medical Association, were guests at the meeting. Both spoke on the political drive for **socialization of medicine** and its effect on medical practice.

SAN MATEO

Dr. Harold Marks resigned January 15 as superintendent of the San Mateo Community Hospital and has taken a similar position at San Joaquin County Hospital. In his new post he succeeds Dr. John Smiley, who resigned.

* * *

Plans are reported under way in San Mateo County for a drive for public subscription to a fund for a larger and more modern **San Mateo County Blood Bank.** Dr. Carl Hoag, president of the blood bank, reported recently that the bank must vacate its present quarters on property of the San Mateo School Department. The blood bank owns a building site in San Mateo but must raise money for construction.

YUBA-SUTTER-COLUSA

Dr. Stanley R. Parkinson of Marysville has been elected president of the Yuba-Sutter-Colusa Medical Society, succeeding Dr. Anthony Fratis, also of Marysville.

GENERAL

Organizing so that they may bring coordinated effort to bear on solutions of areawide problems of public health, county health officers of eight San Joaquin counties have formed the **San Joaquin Valley Health Officers' Association.** The counties embraced in the new organization, and the names of representatives, follow: Merced, Dr. C. A. Moyle; Tulare, Dr. R. Lynn Knight; Madera, Dr. J. T. Deuel; Fresno, Dr. William F. Stein; Kern, Dr. William C. Buss; Kings, Dr. Donald E. Upp; Stanislaus, Dr. George O'Brien; San Joaquin, Dr. E. M. Bingham.

At the first meeting of the association, Dr. Moyle was elected president, Dr. Knight vice-president, and Dr. Deuel secretary.

* * *

The annual meeting of the **American Goiter Association** will be held in the Shamrock Hotel, Houston, Texas, March 9, 10 and 11.

* * *

During March, volunteers in communities throughout the nation will ask the American people to contribute $67,000,000 to carry on the services of the **American Red Cross** for the 1950-51 fiscal year. The goal for California is $6,700,000.

POSTGRADUATE EDUCATION NOTICES

College of Medical Evangelists, Graduate School of Medicine

Course: Histology and Histopathology of the Eye (50 hours).
Date: March 1 to June 21, 1950, Wednesdays 7:00 to 10:00 p.m.
Fee: $75.00.
Course: Varicose Veins (6 periods).
Date: March 3 to April 6, 1950, Thursdays 7:00 to 9:00 p.m.
Fee: $25.00.
Course: Endocrinology (8 periods).
Date: April 3 to May 22, 1950, Mondays 8:00 to 9:30 p.m.
Fee: $30.00.
Course: Minor Orthopedic Surgery (8 periods).
Date: April 6 to May 25, 1950, Thursdays 8:00 to 9:30 p.m.
Fee: $30.00.
Contact: H. M. Walton, M.D., Dean, Graduate School of Medicine, College of Medical Evangelists, 312 North Boyle Avenue, Los Angeles 33, California.

University of Southern California, Medical Extension Education

Course: Survey Course for General Practitioners.
Date: March 13, 1950, through March 17, 1950, five days, full-time.
Fee: $50.00.
Place: Los Angeles County Hospital.
Course: Hematology.
Date: March 6, 1950, 12 weekly sessions.
Fee: $50.00.
Courses in Anesthesia to be arranged. General Review of Clinical Anesthesia; Basic Principles and Techniques. 12 weeks. Tuition $50.00 to $300.00.

University of California, Medical Extension

Course: Internal Medicine and General Surgery.
Date: April 24 through 28.
Course: Psychiatry for the General Practitioner.
Date: April 24 through 28.
Contact: Stacy R. Mettier, M.D., Medical Extension, University of California Medical School, San Francisco 22, California. Fee and printed program supplied on request.

Stanford University School of Medicine

Course: Postgraduate conference in Clinical Ophthalmology, March 27 through March 31, 1950. Registration will be open to physicians who limit their practice to the treatment of diseases of the eye, ear, nose and throat. In order to allow free discussion by members of the conference, registration will be limited to 30 physicians. Instructors will be Drs. A. Edward Maumenee, Dohrman K. Pischel, Jerome W. Bettman, Earle H. McBain and Arthur J. Jampolsky. Programs and further information may be obtained from Office of the Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

Regional Seminar

California Medical Association Postgraduate Activities Committee, the California and the Merced County Tuberculosis and Heart Association Seminar on Heart Diseases will be held at the Merced Women's Clubhouse, March 3, 1950, afternoon and evening. The various aspects of diagnosis and treatment of the cardiac diseases will be covered, including the use of ACTH and Cortisone. A portion of the evening session will be devoted to a round-table discussion.

California Cancer Commission

The California Cancer Commission has announced two February refresher courses in neoplastic diseases for practicing physicians and surgeons. One is to be held in Los Angeles, the other in Oakland.

The Los Angeles course, which is to be given with the cooperation of the Tumor Board of the Los Angeles County General Hospital, is scheduled for Sunday and Monday, February 19 and 20. Meetings will be held in the auditorium of the Los Angeles County General Hospital at 1:30 p.m. and again at 7:30 p.m. on both days. In addition to California speakers, there will be three visiting instructors: R. Lee Clark, M.D., professor of oncology, Graduate School, University of Texas; Charles B. Puestow, M.D., professor of surgery, University of Illinois, Chicago; and Michael E. DeBakey, M.D., professor of surgery, Baylor University College of Medicine, Houston.

The Oakland course, which was arranged with the cooperation of the California division of the American Cancer Society, is to be given Wednesday and Thursday, February 22 and 23, in the auditorium of Providence College of Nursing, 390 Central Avenue, Oakland. Afternoon sessions from 1:30 to 5 and evening sessions from 7:30 to 9 will be held both days. The same three visiting instructors who are to address the Los Angeles meetings will also speak at Oakland.

Specialists as well as general practitioners are cordially invited. There will be no registration fee for either course. Financial assistance is being provided by the American Cancer Society as well as the California State division.

The California Medical Association **postgraduate seminar held at Modesto** January 19 was attended by over seventy physicians from the Stanislaus, San Joaquin and Merced county societies. The speakers were commended upon their presentations. Dr. Edwin G. Clausen, Oakland, pointed out common errors in the diagnosis and surgical treatment of solitary adenomas of the thyroid, painless jaundice, gastric ulcer, varicose veins and intestinal obstruction. Dr. Fenimore E. Davis, Oakland, discussed refinements in spinal anesthesia, use of curare preparations in general anesthesia and the indications and technique for using intravenous procaine. Observation of the basic principles of surgery in treatment of compound fractures, and the avoidance of introducing foreign body fixation even with the adjunct of antibiotics, were emphasized by Dr. Douglas D. Toffelmier, Oakland.

Treatment of the bleeding peptic ulcer was discussed at the evening session. Discussing the general and clinical laboratory methods of proper evaluation and care during the medical regimen, Dr. Fletcher B. Taylor, Oakland, emphasized the value of medical and surgical consultation at 12-hour intervals during the critical period. Dr. Arthur J. Hunnicutt, Oakland, who presented the surgical aspects of the problem, pointed out the importance of oxygen therapy, adequate replacement of lost blood and the indications for subtotal gastrectomy for intractable or recurring hemorrhages.

* * *

"Teamwork" is the theme of the 35th annual meeting of the **American Association of Industrial Physicians and Surgeons** and four other industrial associations which will be held in the Sherman Hotel in Chicago, April 22-29. Registration during the meeting is expected to exceed 2,000. The four other groups are the American Industrial Hygiene Association, the American Conference of Governmental Industrial Hygienists, the American Association of Industrial Nurses, and the American Association of Industrial Dentists.

* * *

A vacancy exists for a **qualified bacteriologist** in the pathology laboratory of the **Veterans Administration Center,** Los Angeles. The position pays $6,400 a year. Qualifications for the post are shown on Standard Form 57, which can be secured at any post office. Applications on Form 57 should be sent to the Personnel Officer, Veterans Administration Center, Los Angeles 25.

~

BOOK REVIEWS

A MANUAL OF THE PENICILLIA. By Kenneth B. Raper, Principal Microbiologist, Fermentation Division, Northern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture, Peoria, Illinois; and Charles Thom, Collaborator, U. S. Department of Agriculture. The Williams and Wilkins Company, Baltimore, Md., 1949. $12.00.

Species of Penicillia are among the most common of the fungi not pathogenic for man and animals. These molds occur widely in nature but attracted relatively little interest until one of them was demonstrated by Fleming to produce penicillin. The discovery of this substance and the search for improved methods of production led to a complete reexamination of the Penicillia.

This book represents the results of this study, and classifies and describes this genus in the greatest detail. The work is of no interest to physicians but will be very valuable to those scientists whose work requires an understanding of these fungi.

* * *

X-RAY TREATMENT — ITS ORIGIN, BIRTH AND EARLY HISTORY. By Emil H. Grubbe, B.S., M.D., F.A.C.P. The Bruce Publishing Company, St. Paul, 1949. $3.00.

This is an interesting monograph of 154 pages written by a Chicago physician of some 50 years' experience in medical practice. The author sincerely believes that he was "the first person in the world to actually make use of these rays in the treatment of disease." He sustained injury to his own hands while working with the rays in 1896 and states that he thereafter applied the rays to a number of patients in the hope of obtaining effects.

The photographs of the author's laboratory in the earlier days of this century, and of the general lecture room in the "Illinois School of Electrotherapeutics" will bring back memories of early physics laboratories to many readers.

Appended to the book is the author's biography including a summation of the ten "firsts" to his credit. It is suspected that some early workers with radiant energy in Europe and South America will contest several of these firsts. Nevertheless, the biographic notes are of considerable interest and reveal to the younger generation the kaleidoscope of medical schools in the Chicago area during the last several decades.

The monograph can be recommended as light reading to those interested in radiation therapy, and in the history of this particular division of medicine.

* * *

RATIONAL MEDICINE. By John W. Todd, M.D. (Lond.) Assistant Physician to Farnham Hospital. The Williams and Wilkins Company, Baltimore, 1949. $6.50.

In 1943 Dr. Todd was sent from England to Asia for a three-year stay which gave him a chance to sit and think, and to consolidate his ideas on his profession. The result, this book: The thoughts of a sensitive and analytical mind on the application of modern medicine to the patient. It is the sort of book which can be written without using a single reference. It is filled with the rebellious philosophy of a conscientious spirit. In it the author jousts at many of the accepted complacencies and fallacies of today's medicine as well as yesterday's. It is a provocative book, calculated to irritate the smug among us.

The book follows, in considerable part, the outline of a textbook of medicine. But the author gives a minimum of data with a maximum of analysis and reasoning. In each chapter, he presents his own ideas on the purpose of the procedure considered. He repeatedly emphasizes the emotional and social sides of an illness along with its physical aspects. At the same time he argues that past psychological evidence should be evaluated in much the same way as past organic evidence. He consistently points out the inadequacies, falsities, pomposities, and limitations of certain time-honored symptoms, signs and tests. He deplores over-simplification (but at times has this very fault, e.g., in the treatment of peptic ulcer on page 204).

His viewpoint is probably best summarized by the following quotation (page 310): "Until the day dawns when the ideas are accepted that man is an indivisible whole, that psychiatry permeates the whole of medicine, and that students should be taught by the same men at the same time and on the same patients about the disorders of the mind as about the diseases of the body, it is to be feared that the misunderstanding of the relations between mind and body will continue."

The book can be highly recommended to all doctors who are not afraid to look at themselves or at their profession, critically and philosophically.

* * *

STERN'S APPLIED DIETETICS — The Planning and Teaching of Normal and Therapeutic Diets. Revised by Helen Rosenthal, B.S., Chief of Frances Stern Food Clinic, the Boston Dispensary, Assistant in Medicine, Tufts College Medical School; Pearl C. Baker, B.S., former Associate, Frances Stern Food Clinic; and Wilma A. McVey, M.D., Assistant in Medicine, Tufts College Medical School. Third edition. The Williams and Wilkins Co., Boston, 1949. $5.00.

This volume outlines the procedure of the food clinic of the Boston Dispensary for the planning and teaching of normal and therapeutic diets. As such, it meets the particular problems which are encountered in this kind of clinic. The techniques described may be satisfactory for filling the food prescriptions for an out-patient department, but they are less suitable for use in the private practice of medicine.

The book is written essentially for the dietitian, the social worker, and the health educator working with a dietitian. The doctor of medicine will find it, for the most part, on a different level from his usual sources. However, Part II and Part III may prove of some value to him: Part II is made up of tables which simplify the computation of diets; Part III is composed of dietary outlines which summarize the purposes and construction of different types of diets. These make a reference which may fit on a physician's shelf.

* * *

TEXTBOOK OF OPHTHALMOLOGY, Vol. IV — The Neurology of Vision Motor and Optical Anomalies. Sir W. Stewart Duke-Elder, K.C.V.O., M.D., Ch.B., F.R.C.S., Surgeon Oculist to H.M. the King, 1081 illustrations, including 71 in color. The C. V. Mosby Company, St. Louis, 1949. $20.00.

The fourth volume of this series is like its predecessors, an excellent text and reference book.

The book has a carefully outlined contents. The book itself contains 13 chapters and 1,123 pages of subject matter.

The chapters on the lesions involving the visual pathways and the field studies in these cases are very well done and very readable. The organization of the symptoms, the typical lesions with careful field studies, makes this portion of the book of interest to the neurologist as well as the ophthalmologist.

Chapter XLIV on pupillary pathways and anomalies is especially well done and excellent reading.

Chapter XLVII to Chapter L on the problems of squint is especially comprehensive. The subject is exhaustively covered from an etiological standpoint. The chapter on noncomitant squint includes every conceivable causative factor including the various diseases, and the various drugs and poisons which may have been ingested.

Chapter LI upon errors of refraction has a very clear-cut and logical discussion of myopia which every ophthalmologist should carefully read.

In conclusion, this volume like its predecessors should be in èvery ophthalmological library.

* * *

ROENTGEN DIAGNOSIS OF DISEASES OF THE SKULL. By Max Ritvo, M.D.—**Annals of Roentgenology.** Paul B. Hoeber, Inc., New York, 1949. $16.00.

The flow of volumes on the roentgen diagnosis of disorders of the head and neck continues unabated. The present volume of approximately 400 pages contains about 370 illustrations, many of them of good quality. The text is clear and not crowded. There are chapters on the x-ray examination of the skull, on the various anomalies, traumatic and postoperative changes, and the infections. Then follow chapters on endocrine and metabolic disturbances, the status of the skull during pregnancy, intracranial opacities of various types, neoplasms and finally cerebral angiography.

The legends under some of the illustrations need revision in the next edition. For example, Figure 261 is described as "aeration of the dorsum sellae" when actually it is a case of calcification of the retrosellar dura. There should be additional close-up reproductions of the sella in the chapters devoted to that portion of the skull. The detail in many of the existing illustrations is not sufficiently clear.

This reviewer trusts that in subsequent editions the use of personal names applied to simple processes will decrease. For example, on Page 342 the author has a short section on "Schmincke tumors." He also uses the synonym "lymphepitheliomas." It might be simpler to use the term nasopharyngeal carcinomas (transitional type).

The volume can be recommended for the libraries of roentgenologists and neurologists.

* * *

MODERN PRACTICE IN PSYCHOLOGICAL MEDICINE—1949. Edited by J. R. Rees, M.D., Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, New York, 1949. $10.00.

This apparently is intended as a text in psychiatry (or psychological medicine, if you will) for the medical student. It consists of contributions by over a score of authors, specialists in the various fields that have greater or less association with the subject. In common with all such works, it gains from the special knowledge of the individual contributors while losing perhaps more than commensurately by the disjointedness inherent in multiple authorship. To this reviewer it appears neither intensive enough for the serious student of the specialty, nor well enough systematized for the newcomer.

The initial chapter, entitled "Health," should be read by physician and layman as well, since it gives clearly and briefly one present concept of psychiatry. This apparently is that the human race is headed for extinction unless those trained in psychological medicine are given an opportunity to overhaul the human nature, ridding us of our hostilities and aggressions, and thus making wars a thing of the past. This psychiatric pipe-dream is not something to give us any great regard for the common sense of the spokesmen of the specialty.

An excellent chapter on neurology seems rather lost in the middle of the book, while the concept of venereal disease as a psychosomatic entity is novel if not entirely orthodox. In all, the book, which is published in England, is of interest to the psychiatrist, but can hardly be recommended as a text for the medical student.

* * *

ORAL BACTERIAL INFECTION—Diagnosis and Treatment. By Lyon P. Strean, M.Sc., Ph.D., D.D.S., F.A.P.H.A., Director of Research, Novocol Chemical Mfg. Co., Inc. With 57 illustrations. Dental Items of Interest Publishing Company, Inc., Brooklyn 7, New York, 1949. $5.50.

This book adds little to the general advancement of the science of bacteriology or to the arts of diagnosis and treatment. Its title and date of original publication suggest a rather complete treatise on oral bacterial infections as well as their diagnosis and treatment, yet not much is recorded therein that deals with infections in the mouth. No mention is made of "strawberry" tongue in scarlet fever. No attempt is made to provide adequate descriptions of Koplik's spots of rubeola and the oral lesions in gonorrheal stomatitis, infectious stomatitis, epidemic stomatitis and mycotic stomatitis. The oral manifestations of diphtheria, syphilis, and anthrax are poorly covered. The book, however, does give a fair account of ulceromembranous gingivitis. Because of these important limitations the book is not of great value as an aid in the diagnosis of oral bacterial infections.

The volume is essentially a summary of medical bacteriology. The author discusses briefly the staining and culturing of bacteria, sterilization techniques and the morphology of bacteria. He skims over the pyogenic cocci, the diphtheria organism, the tubercle bacillus, the colon-typhoid-dysentery group and other pathogenic bacteria. He deals briefly with the antibiotics and immunity and offers little information about the pathogenic fungi, the protozoa and the filterable viruses.

In the preface it is stated that the author intends this book ". . . as a text for medical and dental students preparing for final examinations and for the general practitioner requiring certain basic information quickly and cannot avail himself of the facilities of a medical library." The reviewer cannot agree that the book will serve well for preparing medical or dental students for final examinations.

Surely the thoroughness with which these important courses are now being taught in our medical and dental schools suggests reference books that are considerably more complete than the book now under consideration through this review. The volume can be of use to dental assistants or laymen who desire superficial information on medical bacteriology.

California
MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION
© 1950, by the California Medical Association

VOL. 72 MARCH 1950 No. 3

Clinical Potassium Problems

HELEN EASTMAN MARTIN, M.D., MAXINE WERTMAN, A.B., LEOLA WESTOVER, A.B.,
D. G. SIMONSEN, Ph.D., and JOHN W. MEHL, Ph.D., *Los Angeles*

SUMMARY

Alterations in serum potassium are common in many diseases. In a series of 390 determinations of serum potassium, the levels found were low in 24 per cent and high in 2.6 per cent.

The major causes of low serum potassium are (1) decreased potassium intake due to intravenous feedings which do not contain potassium; (2) increased loss of potassium in the urine due to accelerated tissue breakdown, or renal lesions; (3) loss from the gastrointestinal tract due to diarrhea, or fistulae, and (4) shift between serum and cells, due to metabolic causes, drugs or changes in pH.

The major cause of high serum potassium is uremia with renal retention.

Clinical symptoms and signs of low body potassium include muscle weakness and paralysis, which may lead to death in respiratory failure if not corrected, tachycardia, gallop rhythm, dilatation of the heart. The electrocardiogram shows inverted, low amplitude, or isoelectric T waves and a prolonged QT interval.

Potassium chloride orally, subcutaneously or intravenously is recommended for use in the treatment of potassium deficits. It should not be used in the presence of oliguria or anuria or dehydration. The amounts of potassium necessary to correct deficits vary widely and cannot be predicted from the serum level. Special reference is made to the prevention and therapy of potassium deficits in diabetic acidosis.

High serum potassium levels are difficult to correct. Suggested measures are administration of glucose, insulin or calcium, gastric or peritoneal lavage or use of the artificial kidney.

UNTIL recently serum potassium levels have been determined in only a few diseases, and usually only by research laboratories, due to the time and difficulty involved in the chemical determination. A rapid yet accurate method is now available to the clinical laboratory with the development and improvement of the flame photometer.[3, 26]

INCIDENCE OF ABNORMAL POTASSIUM LEVELS

The widespread alterations in serum potassium which may occur clinically are becoming increasingly apparent as more tests are made. This is illustrated in Table 1 which shows the incidence and the abnormal values found during one month in a large county hospital. It is significant that 27 per cent of the 390 determinations made were abnormal, with 24 per cent low and 2.6 per cent high. With one exception, the high serum potassium values were found in patients with uremia, and were due to

---

From the Department of Medicine of the University of Southern California School of Medicine and the Los Angeles County General Hospital.

Presented before the Section on Medicine at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

renal retention of potassium. The low serum potassium values were found in a wide variety of conditions. On the surgical service the vast majority were due to inadequate intake of potassium in the postoperative state, because of prolonged use of parenteral fluids without potassium, combined with nasogastric suction, and alkalosis. A few cases were associated with intestinal fistulae and increased loss of potassium by this route. On the medical service the conditions associated with low serum potassium levels included poor intake of food due to wasting diseases, prolonged use of intravenous feedings without potassium, diabetic acidosis under treatment, Addison's disease treated with desoxycorticosterone acetate, and acute pancreatitis.[14]

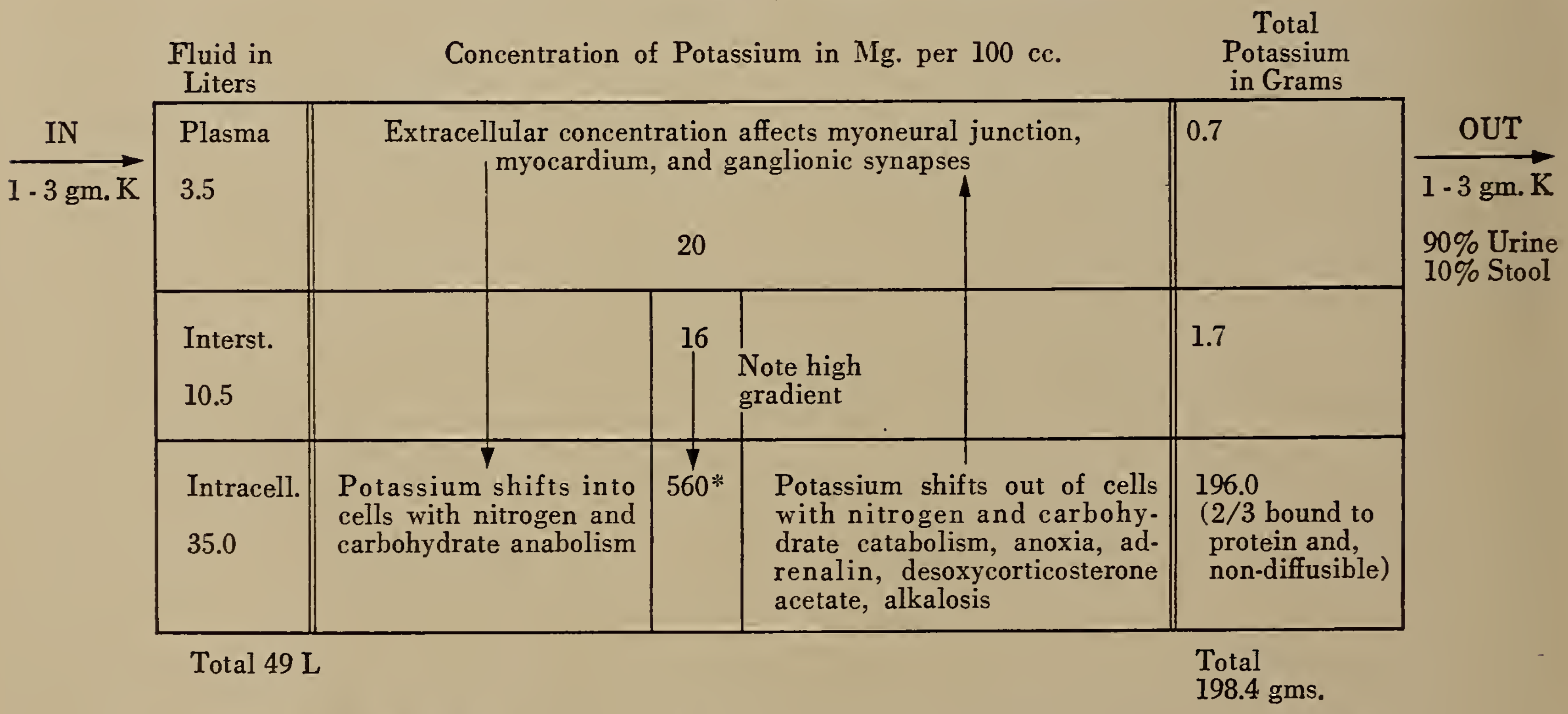
NORMAL POTASSIUM BALANCE

To understand the alterations in potassium which occur in disease, it is necessary to consider the normal movements and distribution of potassium in the body. This can be schematically represented (Chart 1). In the average diet there are 1 to 3 gm. of potassium (meat, nuts, vegetables, fruit, milk). The urinary output of potassium about equals the intake, if cellular levels and renal function are normal. There is a constant turn-over of potassium in the body, as demonstrated by studies with radioactive potassium,[18] but the total balance remains constant if the intake and output are equal. Potassium is present in very low concentrations (16 to 20 mg. per 100 cc.) in the plasma and interstitial fluid. The extracellular concentration, although low, appears to be necessary for the activation of acetylcholine and transmission of the electrical impulse along nerves or across the myoneural junction.[17] The exact role of potassium, however, in neuromuscular physiology is largely unsettled. The great bulk of the body potassium is in the cells, where it is the major cation. This is in contrast to the position of sodium, which under usual conditions is the major extracellular cation, with low intracellular concentrations. Two-thirds of the cellular potassium is bound to protein and does not diffuse. The remainder passes in and out of the cell. The mechanism of the passage of potassium through the cell membrane is poorly understood, and may be under chemical, physical or hormonal control. It is to be noted that potassium enters the cell against a very high diffusion gradient. It is known that potassium shifts into the cells during protein[1, 31] or carbohydrate[16] anabolism, and out of the cells during tissue breakdown and in alkalosis.[11, 12] Adrenalin,[13] desoxycorticosterone acetate,[19, 46] and digitalis[7] may also cause a shift of potassium out of the cells. Potassium administration causes the disappearance of ectopic heart beats resulting from toxic levels of the digitalis glycosides.[41]

TABLE 1.—*390 Serum Potassium Determinations, Los Angeles County General Hospital*

I. *Number of Low Serum Potassium Levels* (under 14 mg. per 100 cc.)	92 (24%)
A. *Surgical Service*	55
Gastrointestinal suction, intravenous feedings, fistulae.	
B. *Medical Service*	37
Malnutrition, intravenous feedings, diarrhea, treatment of diabetic acidosis, treatment of Addison's disease, acute pancreatitis, thyroid crisis.	
II. *Number of High Serum Potassium Levels* (over 25 mg. per 100 cc.)	10 (2.6%)
All but one due to renal failure.	

CHART 1.—*Distribution of Potassium (150 lb. man.)*


Fluid in Liters
Concentration of Potassium in Mg. per 100 cc.
Total Potassium in Grams
IN
1 - 3 gm. K
Plasma
3.5
Extracellular concentration affects myoneural junction, myocardium, and ganglionic synapses
20
0.7
OUT
1 - 3 gm. K
90% Urine
10% Stool
Interst.
10.5
16
Note high gradient
1.7
Intracell.
35.0
Potassium shifts into cells with nitrogen and carbohydrate anabolism
560*
Potassium shifts out of cells with nitrogen and carbohydrate catabolism, anoxia, adrenalin, desoxycorticosterone acetate, alkalosis
196.0
(2/3 bound to protein and, non-diffusible)
Total 49 L
Total 198.4 gms.

*This is the figure given by Gamble,[23] and in view of recent biopsy studies may be too high.

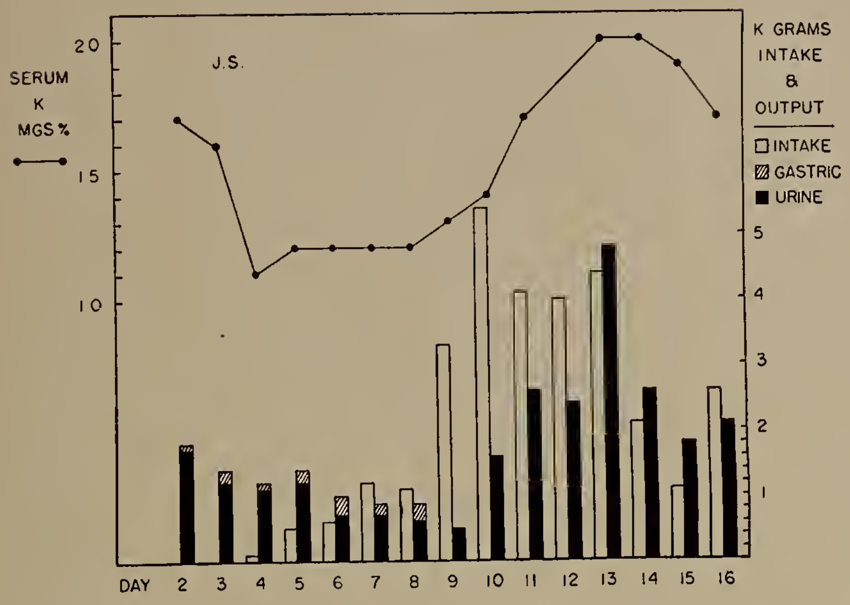


Chart 2.—Potassium balance in postoperative patient (white male, aged 13).

MECHANISMS OF CHANGES IN POTASSIUM IN DISEASE

The three mechanisms which can cause shifts in serum potassium levels are: Changes in intake, changes in output, and shifts between cells and serum.

Low Serum Potassium:

Inadequate intake of potassium is the most frequent clinical cause of low serum and cellular potassium levels. As the urine apparently never is potassium-free, continued urinary excretion of potassium explains the fall in body potassium when there is no intake. This is illustrated in Chart 2. The patient in the case from which the chart was drawn, a young boy with a ruptured appendix and generalized peritonitis, had vomited and had had diarrhea for several days before entry. In four days without intake of potassium, the serum level fell from 17 to 11 mg. per 100 cc. Intake of 0.6 to 1.2 gm. of potassium a day maintained the serum level at 12 mg. per 100 cc. from day 5 to day 9. The patient received 3 to 5 gm. daily for five days (days 9 to 14) before correction of the serum potassium deficit occurred. It is to be noted that potassium continued to be lost in the urine in amounts of 1.1 to 1.7 gm. per day during the period when there was no potassium intake. Urinary output of potassium increased as the body deficit was corrected, and the intake increased. The loss of potassium by nasogastric suction (0.1 to 0.3 gm. daily) contributed slightly to the potassium deficit.

Increased excretion of potassium in the urine is related to increased nitrogen excretion due to any cause (increased tissue breakdown due to infection, neoplasm, uncontrolled diabetes,[2] starvation, following trauma, and postoperative states.[1, 31]) Here potassium shifts out of the cells with nitrogen. Certain drugs, such as desoxycorticosterone acetate[19] and large saline infusions[44] cause an increased loss of potassium in the urine, also. Certain patients with chronic renal disease excrete large amounts of potassium in the urine.[4]

The problem of the renal control of potassium is still unsolved. In general, patients continue to excrete potassium (as illustrated in Chart 2), even though there is a body deficit of potassium.[45] However, the authors have observed a few patients with serious potassium deficits who have conserved potassium as vigorously as sodium, excreting urine exceedingly low in potassium—8 to 10 mg. per 100 cc. The normal individual tends to excrete extra potassium which is ingested.[45] If there is a body deficit of potassium, ingested potassium is largely retained.[45] The elevated serum potassium levels occurring in uremia are due to decreased glomerular filtration.[15] At high and normal serum potassium levels the kidney both filters and secretes potassium.[38]

While normally only a small part of potassium (10 per cent) is excreted in the stool, in the presence of diarrhea or fistulae sizeable losses may occur.[33] This was first emphasized by Darrow[10] in infantile diarrhea, but it has now been shown to occur in other types of diarrhea, as sprue.[27] Small amounts of potassium are present in the gastric juice, and are lost to the body by use of nasogastric suction or prolonged vomiting. This loss may be accentuated by using distilled water for irrigation of the suction apparatus.

The shift from serum to cells occurs during nitrogen and carbohydrate anabolism. The intensive insulin therapy of diabetic acidosis causes serum potassium to fall,[28, 30, 34] presumably due to a movement of potassium into the cell with carbohydrate.[16] Intensive glucose treatment in the non-diabetic may also cause a shift of potassium into the cell.[21] In familial periodic paralysis there occurs a spontaneous shift from the serum to the cells.[24] As this frequently follows carbohydrate ingestion, it is suggested that increased uptake of potassium by the cells in carbohydrate anabolism is responsible. Testosterone causes a shift of potassium into the cells during protein anabolism.[5] Potassium moves out of the cell in both acidosis[2] and alkalosis.[11, 12] A cellular and serum deficit of potassium occurs in all types of metabolic alkalosis and its correction is essential in the treatment of the alkalosis.

High Serum Potassium:

Decreased glomerular filtration[15] occurring in both acute and chronic renal disease and associated with nitrogen retention and excessively high intakes of potassium is the major cause of high serum potassium levels. The serum level is also raised in dehydration.

DISEASE STATES ASSOCIATED WITH POTASSIUM CHANGES

A summary of the disease states associated with potassium disorders, with the mechanism of the change in potassium values, is shown in Table 2.

Alterations in Muscle Potassium Content:

In general, low serum potassium levels are associated with decreased potassium concentrations in the cell. There are a few exceptions. In familial periodic paralysis the muscle levels of potassium are normal with a low serum level. This also occurs following the use of testosterone. In the severe dehydration in untreated diabetic acidosis the muscle levels of potassium may be low with elevated serum levels. This may also occur during intravenous therapy of low serum potassium levels due to any cause. Low muscle levels of potassium are found in myotonia congenita and nutritional muscular dystrophies.[8] In myasthenia gravis the muscle level may be high,[18] but this is rare, as it is difficult to greatly increase the muscle potassium content. High serum potassium levels may be associated with slightly elevated, normal or low muscle potassium content.

THE EFFECTS OF CHANGES IN BODY POTASSIUM

As many abnormal serum potassium values are being found (Table 1), it becomes important clinically to evaluate the effects of changes in body potassium in order to decide when treatment is indicated. A summary of the effects of potassium

TABLE 2.—*Disease States Associated with Abnormal Potassium Levels*

Low Serum Potassium:

Clinical Condition	*Mechanism of Shift in Potassium*
1. Any illness, particularly postoperative states, with prolonged use of intravenous feedings not containing potassium.	1. Inadequate intake of potassium.
2. Chronic wasting diseases, with malnutrition, as malignancy, advanced congestive heart failure, tuberculosis or starvation.	2. Inadequate intake of potassium.
3. Conditions which may be associated with negative nitrogen balance: a. Postoperative states. b. Trauma, as crushing injuries. c. Infections. d. Uncontrolled diabetes. e. Acute anoxia.	3. Increased loss of potassium with nitrogen in the urine.
4. Loss of gastrointestinal content. a. Diarrhea—all types. b. Gastrointestinal fistula—pancreatic, biliary and fecal.	4. Loss of potassium in gastrointestinal content, plus poor absorption.
5. Familial periodic paralysis.	5. Shift from serum to cells.
6. Diabetic acidosis during therapy.	6. Increased loss in urine before therapy. Shift from cells to serum with insulin therapy.
7. Addison's disease, treated with desoxycorticosterone acetate.	7. Shift from cells to serum with increased loss in urine.
8. Metabolic alkalosis.	8. Increased loss in urine.
9. Cushing's disease with alkalosis.	9. Increased loss in urine.
10. Chronic renal disease (rare patient with more tubular than glomerular involvement).	10. Increased loss in urine.
11. Lower nephron nephrosis (recovery stage with diuresis).	11. Increased loss in urine.
12. Hyperthyroidism (rare).	12. Shift from serum into cells.
13. Acute pancreatitis.	13. Uncertain.

High Serum Potassium:

Clinical Condition	*Mechanism of Shift in Potassium*
1. Any chronic renal disease with decreased glomerular filtration.	1. Renal retention due to decreased glomerular filtration.
2. Upper and lower nephron nephrosis, acute stage.	2. Renal retention (back diffusion through tubules into blood).
3. Any state associated with severe dehydration (as untreated diabetic acidosis).	3. Hemoconcentration.
4. Untreated Addison's disease.	4. Hemoconcentration plus renal retention.
5. Excess potassium intake plus impaired renal function.	5. Renal retention.
6. Burns.	6. Shift from cells to serum (changes in cellular permeability and hemolysis).
7. Acute ischemia of muscle mass.[40]	7. Rapid tissue breakdown with liberation of nitrogen and potassium. Some degree of renal failure (?).

Table 3.—*Familial Periodic Paralysis* (The patient, a man 25 years of age)

Day	Hour	Serum Potassium Mg. per 100 cc.	RBC Potassium Mg. per 100 cc. cells	Urine Potassium Mg. per 100 cc.	Treatment Oral KCl Gm.	Clinical State
1	0					Operation
	11					
	18					Quadriplegia
2		6.3	350	16.6	2	Quadriparesis
3		17.2	......	208.0	4	Weak
4		19.2	354	498.0	2	No weakness

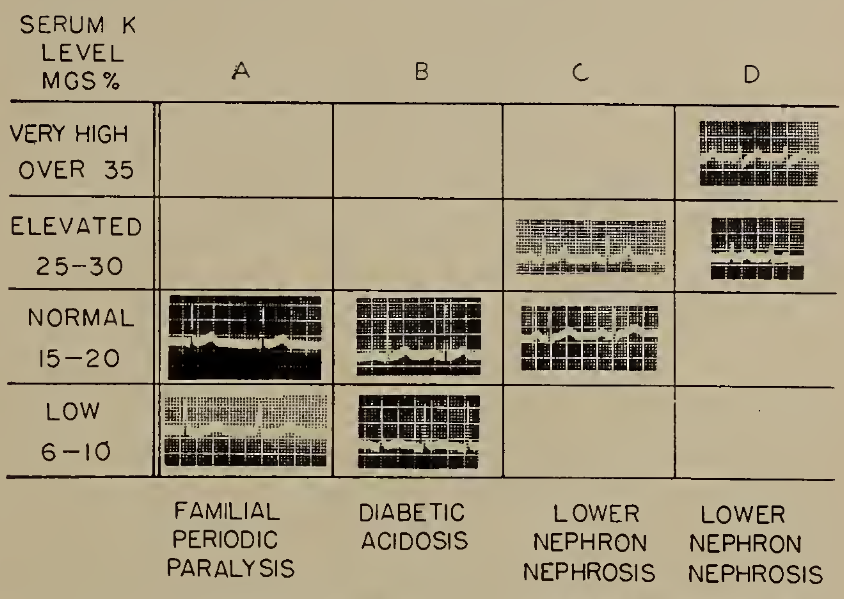


Chart 3.—Electrocardiographic changes associated with serum potassium changes.

changes reported in the literature, correlated and illustrated by the authors' material, is given.

Low Serum Potassium Levels:

The symptoms and signs of low serum potassium include muscle weakness, irritability, paralysis, tachycardia (rarely bradycardia), dilatation of the heart with gallop rhythm, and electrocardiographic changes.

Weakness and paralysis of muscles associated with low serum potassium levels have been reported in familial periodic paralysis,[24] during the therapy of diabetic acidosis,[22, 30, 34] in some patients with chronic renal disease[4] and in desoxycorticosterone acetate therapy of Addison's disease.[47] In some of these patients death has occurred due to paralysis of the respiratory muscles. Three deaths due to respiratory failure, associated with low serum potassium levels, occurred at the Los Angeles County General Hospital from September 1947 to January 1949. An autopsy was performed on each patient.

Case 1: A boy, aged 15 years, entered the hospital with a ruptured cecum and generalized peritonitis. He had nasogastric suction and parenteral feedings for nine days. Vomiting and severe diarrhea occurred after normal feeding was resumed. Respiratory paralysis developed and the patient died. The serum potassium level was 5.3 mg. per 100 cc.

Case 2: A girl one year of age entered the hospital with diarrhea and died of respiratory failure. The serum potassium level was 7 mg. per 100 cc.

Case 3: A girl, aged 17 years, entered the hospital with diabetic acidosis. Following intensive therapy of the diabetic acidosis respiratory paralysis developed, with a serum potassium level of 8 mg. per 100 cc., and the patient died despite use of a respirator and parenteral potassium therapy.

These deaths, all in young individuals, stress the potential importance of very low serum potassium levels (under 10 mg. per 100 cc.).

The relationship of low serum potassium levels and muscle paralysis and weakness is illustrated further by the case of a patient with familial periodic paralysis (Table 3): Following operation for traumatic injury to the eye, quadriplegia developed. Shortly thereafter the serum potassium level was 6.3 mg. per 100 cc. As the serum level returned to normal there was complete recovery of muscle strength. It is to be noted that the urinary excretion of potassium was very low during the stage of paralysis, with gradual increase following oral potassium therapy. No shift of potassium into the red cells occurred. The potassium shift from the serum in this disease is suggested to be into the liver cells.[24] The muscle paralysis related to low serum potassium levels, as observed in this patient, usually affects first the muscles of the trunk and extremities, in contrast to myasthenia gravis, in which involvement of the cranial nerves is most striking. Involvement of the cranial nerves and sensorium is rare with potassium deficits, and if it occurs it is a late phenomenon. The electrocardiographic changes typical of low serum potassium, with return to a normal pattern as the serum concentrations reached normal (Chart 3), were noted in this case.

There has been considerable disagreement in the literature about the relationship of low serum potassium levels and muscle weakness or paralysis. Some observers feel that there is no direct correlation.[5, 29, 37] It is to be noted that many of the patients with potassium deficits are critically ill with the primary disease and do not recognize muscle weakness, as such, unless it progresses to frank paralysis. If these patients are carefully examined, muscle weakness frequently can be detected. Further, it has been possible often to predict low serum potassium levels on the basis of the muscle weakness alone. It is the clinical impression of the authors that patients with serum potassium levels under 12 mg. per 100 cc. show some degree of muscle weakness. Striking improvement in muscle strength has been noted as potassium deficits alone have been corrected. Dynamometer studies have been reported by Harvey[29] in one patient during the therapy of diabetic acidosis, with striking correlation of low serum potassium level with decreased muscle strength. Further studies of this type are indicated as a more objective method of evaluating muscle strength.

Generalized muscle irritability has been present in a few patients with potassium deficits.

The cardiovascular changes related to low serum potassium may be divided into clinical signs and electrocardiographic changes. Tachycardia was a prominent feature in most patients with serum potassium levels under 10 mg. per 100 cc. who were observed by the authors. This persisted in some after correction of the serum potassium deficit. Only one of the patients (familial periodic paralysis) had bradycardia. Bradycardia has been reported by others as an effect of low serum potassium in familial periodic paralysis.[39] It may be due to vagal effect. In some patients dilatation of the heart, systolic murmurs, and gallop rhythm developed. These signs, which usually disappeared rapidly with correction of the potassium deficit, suggest at least functional myocardial impairment. Elevation of the blood pressure has been reported associated with low serum potassium levels occurring during the therapy of diabetic acidosis.[22] This correlation was not noted by the authors in a study of potassium changes in a large number of patients with diabetic acidosis.

The electrocardiographic changes associated with low serum potassium have been well documented[35, 48] and need to be reviewed only briefly. Low serum potassium levels are associated with delayed A-V conduction (the authors have not seen this change), prolonged QT intervals and inverted, very low amplitude or flat rounded T waves. With correction of the serum potassium level, these changes usually revert to normal. These changes are illustrated in Chart 3 "*a*" and "*b*," which show flat rounded T waves in familial periodic paralysis and flat, low amplitude T waves in diabetic acidosis, both associated with serum potassium levels under 10 mg. per 100 cc. The QT interval is prolonged in both instances. The tracings reverted to normal as the serum potassium level became normal.

High Serum Potassium:

The symptoms and signs of high serum potassium levels are usually masked by uremia but may include bradycardia, dyspnea, coma and shock. The patients with potassium levels over 35 mg. per 100 cc. who have been observed by the authors have all died rapidly of cardiac standstill. Respiratory or muscle paralysis has been reported by several authors[20, 29] as occurring both due to high and low serum potassium. Harvey[29] suggests that the important feature is the imbalance between serum and cellular concentration. No instance of muscle paralysis due to high serum potassium has been noted in the series observed by the authors. The electrocardiographic changes associated with high serum potassium levels are striking and are illustrated in Chart 3. Between serum potassium levels of 25 and 30 mg. per 100 cc. the T waves become tall and peaked ("*c*"—lower nephron nephrosis). At about 35 mg. per 100 cc. the P waves disappear and the QRS complex widens ("*d*"—lower nephron nephrosis). With the potassium level between 40 and 50 mg. per 100 cc., the ventricular complexes become increasingly bizarre, with development of ventricular fibrillation (not illustrated). The changes in the electrocardiogram with high serum potassium have been discussed by many investigators.[20, 46, 48]

DIAGNOSIS OF POTASSIUM DEFICITS OR EXCESSES

The diagnosis of potassium changes rests on three principles:

1. *The recognition of clinical conditions* which potentially can alter the serum potassium level. These include conditions which alter potassium intake, or change in the potassium output from the body via the urine or from the gastrointestinal tract, and drugs or metabolic lesions which can cause shifts between cells and serum or serum and cells.

2. *A recognition of clinical signs of potassium deficits,* such as muscle weakness, paralysis, or irritability, and cardiovascular effects (dilatation of the heart, gallop rhythm, in conjunction with electrocardiographic changes).

3. *Determination of serum levels, and serial electrocardiograms.* Serial electrocardiograms may be very useful where serum potassium levels cannot be obtained. Some electrocardiograms are so striking that a diagnosis can be made on one tracing, but in general, serial tracings are necessary.

TREATMENT

Low Serum Potassium:

The problem of therapy for potassium deficits divides itself into three categories:

1. Prophylaxis, where possible, of potassium loss.
2. Treatment of the underlying cause of potassium loss, as diarrhea.
3. The immediate treatment of the serum potassium deficit.

In situations which are known to cause low serum potassium, it would be advantageous to prevent changes. Potassium should be added to intravenous solutions if a patient has to be maintained for more than a few days on them. Three to four grams of potassium chloride daily will prevent serious potassium deficits.

Treatment of the underlying causes of potassium deficit, as diarrhea, diabetic acidosis, etc., requires little comment.

The following plan for correction of potassium deficits has now been used in several hundred patients at the Los Angeles County General Hospital, without mishap. It is the policy to give potassium to all patients with serum potassium levels under 12 mg. per 100 cc. whether there are obvious symptoms or not. Potassium is not administered to any patient with dehydration until the dehydration is at least partially corrected. No potassium is given if there is oliguria or anuria. Unless the clinical situation is urgent, two to three days is taken to correct potassium deficits. Where possible, the oral route of administration is used.

For oral administration, enteric-coated tablets of potassium chloride (0.3 gm.) and a 1 per cent solution of potassium chloride have been used. The solution is preferred, as the enteric-coated tablets have been found occasionally in the stools unchanged, and frequently it has been necessary to give the material to a patient through a Levine tube. With the use of a 1 per cent solution there has been little irritation, although occasionally diarrhea has developed. The amount used depends on the serum level and the primary disorder. For adults, between 4 and 12 gm. of KCl daily is given orally in divided doses until the serum deficit is corrected. Potassium chloride can also be given as a retention enema (5 to 10 gm. as a 1 per cent solution).

Potassium for intravenous or subcutaneous administration has been given as a 0.1 per cent solution of KCl (occasionally as a 0.2 per cent solution). Potassium chloride is prepared in vials (1 gm. in 15 cc. of distilled water), sterilized and then added to 1,000 cc. of parenteral fluid (as isotonic saline, glucose in water or saline, amigen, ammonium chloride). The liter of fluid is then given slowly over a period of two to three hours. With this dilution and time of administration there is little danger of too rapid shift of the serum level. Potassium chloride in 0.1 per cent strength is nonirritating. Several observers have reported the use of 1 to 2 per cent potassium chloride intravenously.[30, 43] These concentrations are hypertonic, and frequently cause severe pain and spasm of the vein. The volume of fluid is small and if care is not taken it may be given too rapidly. Darrow's solution, which is commercially available, contains potassium chloride, but also contains sodium. Because it is frequently necessary to administer potassium without sodium, the separate solution is preferred. In general, where intravenous or subcutaneous administration is required 2 to 4 gm. of potassium chloride is given daily, unless there are acute symptoms of potassium deficit; in that event, much more may be necessary, and a more concentrated solution is used. Where large amounts of potassium need to be given intravenously, serial electrocardiograms are helpful in following serum potassium concentrations. Potassium is given until the electrocardiogram tracings, particularly the T waves, become normal (see case reported by Harvey[29]). In this way toxic levels can be prevented.

Results of therapy are shown in Table 4. The fact that dosage for correction of serum levels varies widely is demonstrated. In Case 2, 13 gm. of potassium chloride (10 gm. by retention enema and 3 gm. subcutaneously) raised the serum level from 9 to 20 mg. per 100 cc. in one and one-half days, while in Case 5, 17.4 gm. raised the level only from 13 to 17 mg. per 100 cc. in two days. The various routes of administration are also shown in Table 4.

Further results of therapy are shown in Table 5. This table gives the serum potassium levels in four patients treated for diabetic acidosis as indicated. Two patients received potassium therapy and two received none. It is noteworthy that the patient (Case 2) who received the largest amount of potassium and also intravenous glucose had no fall in serum potassium level. Further evidence that intravenous glucose is not the only factor in the fall of serum potassium level, as suggested by some,[43] is seen in Cases 1 and 4 (Table 5). Both patients had pronounced fall in serum potassium level during the first 24 hours of insulin therapy. One received a large amount of intravenous glucose (240 gm.), and the other only a small amount of glucose (50 gm. subcutaneously). One patient (Case 3) received no intravenous glucose, but did receive a large amount of potassium, and the serum potassium level was maintained. From a study of potassium therapy and potassium deficits in 50 patients in diabetic acidosis[34] the authors feel that large amounts of intravenous glucose do accelerate the fall in serum potassium, but are not the only factor. Several articles[22, 30, 43] have given the impression that 1 to 2 gm. of potassium salt intravenously or orally would correct the potassium deficit in diabetic acidosis. The retention of potassium in the patients reported by Danowski[9] and co-workers indicates that much larger amounts are usually necessary. Harvey[29] also reported giving 33 gm. of potassium in 15 hours to correct paralysis occurring in one patient during

TABLE 4.—*Results of Therapy of Low Serum Potassium Levels*

Case No.	Age and Sex	Diagnosis	Mg. per 100 cc. Serum Potassium	Time	Gm. KCl	Route
1.	63 F.	Diabetic acidosis	9.2 to 20	1 day	12	Oral.
2.	62 M.	Pyloric obstruction	9.0 to 20	1½ days	13	Retention enema & subcut.*
3.	67 M.	Gastroenterostomy	8.0 to 13.4	2 days	14	I.V.† and Oral.
4.	49 M.	Bleeding peptic ulcer	9.0 to 15	2 days	8	I.V. and Subcut.
5.	13 M.	Ruptured appendix	13 to 17	2 days	17.4	I.V. Subcut. and Oral.
6.	35 F.	Acute pancreatitis	9 to 13 11 to 13	2 days 4 days	7 22	I.V. Oral.

* Subcut.—Subcutaneous. † I.V.—Intravenous.

Table 5.—*Treatment of Diabetic Acidosis*

Case No.	Sex and Age	Serum Potassium 0 hr. Mg. per 100 cc.	Serum Potassium 24 hr. Mg. per 100 cc.	Intake Potassium Gm.	Urine Output Potassium Gm.	Balance Potassium Gm.	Intravenous Glucose Gm.	Insulin Units
1.	F. 63	19.9	9.2	0	1.84	—1.84	240	400
2.	M. 26	16.5	16.0	9.14	4.70	+ 4.44	100	225
3.	F. 77	22.2	24.5	6.80	0.97	+ 5.83	0	205
4.	F. 29	22	13.6	0.35	1.73	—1.38	50 Subcut.	210

therapy of diabetic acidosis. The authors' results, as illustrated by the examples in Table 5, also indicate that large amounts of potassium may be necessary. It is now routine practice with the authors to give all patients in severe diabetic acidosis, if renal function is adequate, 1 gm. of potassium chloride in 1 liter of isotonic saline intravenously at the fourth hour of therapy, and 12 gm. of potassium chloride orally, in divided doses, during the first 24 hours, starting at the fourth hour. The first dose is given intravenously, as several patients have been observed who had critically low serum potassium levels, despite severe dehydration, at the time of admission to the hospital.

High Serum Potassium:

The treatment of high serum potassium is also important, as it can be as lethal as low serum levels. To date less attention has been directed to this problem. Many patients dying in uremia actually die of the effect of high serum potassium. If the renal lesion is a potentially reversible one, as is true in many cases of upper or lower nephron nephrosis, reduction of the serum potassium level may be lifesaving. Several methods have been advocated: Glucose and/or insulin[6, 25] to shift the potassium into the cells, large saline infusions to wash out potassium[42] in the urine or correct extracellular sodium deficits,[20] calcium to antagonize potassium effect on the heart,[49] peritoneal[42] lavage or artificial kidney[32] to clear potassium from the serum. The authors have used insulin and glucose in three patients for 12 to 24 hours, with only slight reduction in the serum levels (2 to 6 mg. per 100 cc.). It is difficult to shift potassium by this method into cells which contain a normal or increased content of potassium. Large saline infusions have not been used, as the majority of patients with high serum potassium levels were oliguric or anuric. With gastric lavage the serum potassium level was decreased from 34 to 26 mg. per 100 cc. in one patient; it was lowered from 25 to 22 mg. per 100 cc. with peritoneal lavage in another patient. Further work is needed on methods of reducing high serum potassium concentrations.

Appreciation is expressed to the Potassium Committee of the Los Angeles County General Hospital for use of material collected by them (Drs. C. J. Berne, Hugh A. Edmondson, Ralph E. Homann, Irving A. Fields, E. Craig Heringman, Telfer B. Reynolds, Edward H. Snyder, and Helen E. Martin, chairman).

REFERENCES

1. Allbright, F., Reifenstein, E. C., Jr., and Forbes, A. P.: Does potassium move with nitrogen? Conference on Metabolic Aspects of Convalescence, Transactions of Eleventh Meeting, page 25, 1945. Massachusetts General Hospital, Boston, Mass.

2. Atchley, D. W., Loeb, R. F., Richards, D. W., Jr., Benedict, E. M., and Driscoll, M. G.: On diabetic acidosis. A detailed study of electrolyte balances following the withdrawal and reestablishment of insulin therapy, J. Clin. Invest., 12:297, March 1933.

3. Berry, J. W., Chappel, D. G., and Barnes, R. B.: Improved method of flame photometry, Indust. and Engin. Chem., Analytical Edition, 18:19, Jan. 15, 1946.

4. Brown, M. R., Currens, J. H., and Marchand, J. F.: Muscular paralysis and electrocardiographic abnormalities resulting from potassium loss in chronic nephritis, J.A.M.A., 124:545, Feb. 26, 1944.

5. Butler, A. N., Talbot, N. B., and MacLachlan, E. A.: Effect of testosterone therapy on concentration of potassium in serum, Proc. Soc. Exper. Biol. and Med., 51:378, Dec. 1942.

6. Bywaters, E. G. L.: Ischemic muscle necrosis, J.A.M.A., 124:1103, April 15, 1944.

7. Calhoun, J. A., and Harrison, T. R.: Studies in congestive heart failure; the effect of digitalis on potassium content of cardiac muscle of dogs, J. Clin. Invest., 10:139, April 1931.

8. Cumings, J. N.: Potassium content of muscle in disease, Brain, 62:153, June 1939.

9. Danowski, T. S., Peters, J. H., Rathbun, J. C., Quashnock, J. M., and Greenman, L.: Studies in diabetic acidosis and coma, with particular emphasis on the retention of administered potassium, J. Clin. Invest., 28:1, Jan. 1949.

10. Darrow, D. C.: The retention of electrolyte during recovery from severe dehydration due to diarrhoea, J. Pediat., 28:515, May 1946.

11. Darrow, D. C.: Disturbances in electrolyte metabolism and their management, Bull. N. Y. Acad. Med., 24:147, March 1948.

12. Darrow, D. C., Schwartz, R., Iannucci, J. F., and Coville, F.: The relation of serum bicarbonate concentration to muscle composition, J. Clin. Invest., 27:198, March 1948.

13. D'Silva, J. L.: Action of adrenalin on serum potassium, J. Physiol., 82:393, Nov. 12, 1934.

14. Edmondson, H.: Personal communication on potassium in acute pancreatitis.

15. Elkington, J. R., Tarail, R., and Peters, J. P.: Transfers of potassium in renal insufficiency, J. Clin. Invest., 28:378, March 1949.

16. Fenn, W. O.: The deposition of potassium and phosphate with glycogen in rat livers, J. Biol. Chem., 128:297, April 1939.

17. Fenn, W. O.: The role of potassium in physiological processes, Physiol. Rev., 20:377, July 1940.

18. Fenn, W. O., Noonan, T. R., Mullins, L. J., and Haege, L.: Am. Journ. Physiol., 135:149, Dec. 1941.

19. Ferrebee, J. W., Parker, D., Carnes, W. H., Curity, M. K., Atchley, D. W., and Loeb, R. F.: Certain effects of desoxycorticosterone. The development of "diabetes insipidus" and the replacement of muscle potassium by sodium in normal dogs, Am. Jour. Physiol., 135:230, Dec. 1941.

20. Finch, C. A., Sawyer, C. G., and Flynn, J. M.: Potassium intoxication, Am. Jour. Med., 1:337, Oct. 1946.

21. Flock, E. V., Bollman, J. L., Mann, F. C., and Kendall, E. C.: The effect of the intravenous injection of glucose and other substances on the concentration of potassium in the serum of the dog, J. Biol. Chem., 125:57, Sept. 1938.

22. Frenkel, M., Goen, J., and Willebrands, A. F.: Low serum potassium level during recovery from diabetic coma with special reference to its cardiovascular manifestations, Arch. Int. Med., 80:728, Dec. 1947.

23. Gamble, J. L.: Chemical Anatomy, Physiology and Pathology of Extracellular Fluid, Harvard University Press, Cambridge, Massachusetts, 1947.

24. Gass, H., Cherkasky, M., Savitsky, N.: Potassium and periodic paralysis. A metabolic study and physiological considerations, Medicine, 27:105, Feb. 1948.

25. Govan, C., and Weiseth, W. M.: Potassium intoxication; report of an infant surviving a serum potassium level of 12.27 mm. per liter, J. Ped., 28:550, May 1946.

26. Hald, P. M.: The flame photometer for the measurement of sodium and potassium in biological material, J. Biol. Chem., 167:499, Feb. 1947.

27. Harrison, E., Tompsett, R. R., and Barr, D. P.: The serum potassium in two cases of sprue, Proc. Soc. Exper., Biol. and Med., 54:315, Dec. 1943.

28. Harrop, G. A., Jr., and Benedict, E. M.: The participation of inorganic substances in carbohydrate metabolism, J. Biol. Chem., 59:683, April 1924.

29. Harvey, A. McGehee: Some physiological experiments of nature in the field of neuromuscular function: Tetraethyl pyrophosphate in the treatment of myasthenia gravis, Potassium deficiency, potassium intoxication, Proc. Inst. Med., Chicago, 17:182, Nov. 15, 1948.

30. Holler, J. W.: Potassium deficiency occurring during treatment of diabetic acidosis, J.A.M.A., 131:1186, August 10, 1946.

31. Howard, J. E., and Bigham, R. S.: Relation of potassium to nitrogen during anabolism and catabolism of protoplasm, Conference on Metabolic Aspects of Convalescence, Transactions of Eleventh Meeting, page 7, 1945, Massachusetts General Hospital, Boston, Mass.

32. Kolff, W. J.: New Ways of Treating Uremia, J. & H. Churchill, Ltd., London, 1947.

33. Lockwood, J. S., and Randall, H. T.: The place of electrolyte studies in surgical patients, Bull. New York Acad. Med., 25:228, April 1949.

34. Martin, H. E., and Wertman, M.: Serum potassium, magnesium and calcium levels in diabetic acidosis, J. Clin. Invest., 26:217, March 1947.

35. Martin, H. E., and Wertman, M.: Electrolyte changes and the electrocardiogram in diabetic acidosis, Am. Heart Journ., 34:646, Nov. 1947.

36. Martin, H. E.: The treatment of the potassium deficit of diabetic acidosis, in preparation.

37. Miller, H. C., and Darrow, D. C.: Relation of serum and muscle electrolyte, particularly potassium, to voluntary exercise, Am. J. Physiol., 132:801, April 1941.

38. Mudge, G. H., Foulks, J., and Gilman, A.: The renal excretion of potassium, Proc. Soc. Exper. Biol. and Med., 67:545, April 1948.

39. Pudenz, R. H., McIntosh, J. F., and McEachern, D.: The role of potassium in familial periodic paralysis, J.A.M.A., 111:2253, Dec. 17, 1938.

40. Rewell, R. E.: Rise in potassium concentration in the blood stream following ischemia of muscle masses, Brit. M. J., 2:483, Oct. 16, 1943.

41. Sampson, J. J., Alberton, E. C., and Kondo, B.: The effect on man of potassium administration in relation to digitalis glycosides, with special reference to blood serum potassium, electrocardiogram and ectopic beats, Am. Heart J., 26:164, August 1943.

42. Seligman, A. M., Frank, H. A., and Fine, J.: Treatment of experimental uremia by means of peritoneal irrigation, J. Clin. Invest., 25:211, March 1946.

43. Sinden, R. H., Tullis, J. L., and Root, H. F.: Serum potassium levels in diabetic coma, N. E. J. Med., 240:502, March 31, 1949.

44. Stewart, J. D., and Rourke, G. M.: The effects of large intravenous infusion on body fluid, J. Clin. Invest., 21:197, March 1942.

45. Tarail, R., and Elkington, J. R.: Potassium deficiency and the role of the kidneys in its production, J. Clin. Invest., 28:99, January 1949.

46. Tarail, R.: The relation of abnormalities in the concentration of serum potassium to electrocardiographic disturbances, Am. J. Med., 5:828, Dec. 1948.

47. Thorn, G. W., Howard, R. P., and Emerson, K., Jr.: Treatment of Addison's disease with desoxycorticosterone acetate, a synthetic adrenal cortical hormone, J. Clin. Invest., 18:449, July 1939.

48. Winkler, A. W., Hoff, H. E., and Smith, P. K.: Electrocardiographic changes and concentrations of potassium in serum following intravenous injection of potassium chloride, Am. J. Physiol., 124:478, Nov. 1938.

49. Winkler, A. W., Hoff, H. E., and Smith, P. K.: Factors affecting the toxicity of potassium, Am J. Physiol., 127:430, October 1939.

Acute Pancreatitis

JOHN R. PAXTON, M.D., *Glendale*, and J. HOWARD PAYNE, M.D., *Los Angeles*

SUMMARY

Pain, and nausea and vomiting are the two cardinal symptoms of acute pancreatitis.

There are variations in the combinations of symptoms that appear in patients who have acute pancreatitis, but in most cases the combination fits one or another of five classifications.

Blood amylase and urinary diastase determinations are valuable aids in the diagnosis of acute pancreatitis. These findings must be correlated with the stage of the disease.

As the disease may be treated successfully (by means outlined) without surgical intervention, clinical diagnosis is important.

Cholecystograms after an attack of acute pancreatitis, although advisable, should not be made too soon after subsidence, because of the danger of exacerbation.

IN 1946 the authors[2] presented a statistical study based on 307 proven cases of acute pancreatitis from Los Angeles County General Hospital. This series represented all cases of proven acute pancreatitis occurring during the 13-year period to January 1946. A review of the cases occurring in this same institution from January 1946 to January 1949 has just been completed. This second series consists of 145 cases which were diagnosed in a three-year period as compared to the first series of 307 cases diagnosed during a 13-year period. This does not represent a total increase in incidence of the disease but, rather, a definite increase in recognition of the disease because of greater diagnostic alertness.

The purposes of this presentation are:

1. To emphasize the usual and unusual manifestations of the disease.[3]

2. To reemphasize the importance of non-operative treatment during the acute phase.

A statistical review of the latter series and the combined series will be published elsewhere later.

SYMPTOMS

The two cardinal symptoms of acute pancreatitis are pain, nausea and vomiting. A discussion of the pathological physiology of these two symptoms was presented in a previous publication.[3] The symptoms of acute pancreatitis may exactly simulate those of any condition producing acute abdominal distress. Usually the onset and course of the disease are such as to make the case fit one of the following five descriptions:

Group I. Sudden onset of severe, excruciating upper abdominal pain commonly occurring in an elderly, obese, florid male who has eaten a large meal several hours previously, preceded by several highballs. Immediately following the onset of pain, nausea and (usually profuse) vomiting occurs. The patient is in profound shock with cyanotic mottled skin, diffuse tenderness and minimal to severe rigidity of the abdomen. Ecchymosis or bluish discoloration in either or both flanks or about the umbilicus may subsequently occur. Death commonly follows in 48 to 72 hours in spite of all forms of therapy directed at control of acute pancreatitis. This is the usual textbook description of the disease, but fortunately this group represents only a small per cent of the cases. Into this group also fall those patients with symptoms simulating those of acute coronary occlusion with pain in the left upper quadrant of the abdomen or in the precordium.

The remaining four syndromes, which are representative of the more common forms of the disease, are not sufficiently emphasized in standard textbooks on surgery.

Group II. The syndrome simulates that associated with acute cholecystitis, with sudden onset of moderately severe epigastric or right upper quadrant abdominal pain which may radiate through to the back or around the right costal margin to the back. The onset of pain is followed by nausea and vomiting, usually moderate in amount, but sometimes profuse. Occasionally there may be associated mild or moderate jaundice, which further confuses the clinical diagnosis. Jaundice was present in 17 of the previously mentioned series of 145 cases.

This syndrome is representative of those cases of acute pancreatitis involving primarily the head of the pancreas. In such cases the patient, early in the course of the disease, may be relieved of symptoms by the use of right paravertebral block. (This will be further discussed under treatment.)

Group III. The symptoms are typical of acute mechanical small intestinal obstruction. The patient may have intermittent, generalized, rhythmic, cramp-like abdominal pain associated with nausea and vomiting, with both clinical and x-ray evidence

---

From the Department of Surgery, University of Southern California School of Medicine, and The Los Angeles County General Hospital.

Presented as part of a Symposium on Diseases of the Gastrointestinal Tract before a Joint Meeting of the Sections on General Medicine, General Surgery, General Practice, and Radiology at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

of distention of the small bowel. Patients in this group usually present no obvious cause for the obstruction (such as an external hernia or abdominal scar), and commonly present is a physical finding which is normally not present in intestinal obstruction. This is flank tenderness, either unilateral or bilateral, which is caused by retroperitoneal extravasation of pancreatic fluid. In the past the largest number of mistaken diagnoses in the authors' series was among patients in this classification. It is now routine to determine blood amylase and urinary diastase in all cases of apparent mechanical small intestinal obstruction without obvious cause.

Group IV. The clinical picture is that of acute alcoholism with acute gastritis characterized by upper abdominal pain with nausea and profuse vomiting. These symptoms may be mild to severe. This group commonly includes cases in which the diagnosis is slow leaking peptic ulcer induced by a recent bout of alcoholism. Because of the known high incidence of acute pancreatitis associated with or during acute alcoholism, the diastatic activity is determined routinely at Los Angeles County General Hospital in any case in which an alcoholic patient is admitted with abdominal symptoms.

Group V. This group includes those cases in which the patient has a mass in the epigastrium or left upper quadrant of the abdomen. Such patients frequently give a history of having had an attack of abdominal pain with nausea and vomiting three or four weeks previously. This represents an attack of acute pancreatitis which has progressed into one of its complications, a pseudocyst, a collection of exudate in the lesser sac or, rarely, a pancreatic abscess.

ASSOCIATED SYMPTOMS

Diarrhea. In the first study reported, diarrhea was noted as having occurred in 22 of 307 cases. In the more recent study it occurred in 17 of the 145 cases. Patients with diarrhea may have associated cramp-like abdominal pain, with nausea and vomiting—symptoms which often cause confusion with the syndrome of acute gastroenteritis or enterocolitis. The authors will probably ultimately classify patients with this combination of symptoms in an additional bracket, group VI, but at present the number of cases is too small to justify such a grouping.

Gastrointestinal Hemorrhage may be associated with acute pancreatitis. Its presence may be manifest in blood in the vomitus or in bloody diarrhea. This is not common, but it occurred in both series studied by the authors. There was no previous report of it in the literature.

DIAGNOSIS

The diagnosis can usually be made from the history, as most cases will fall into one of the previously described groups. The physical findings vary considerably according to the stage of the disease and the severity of the process. Practically all patients have moderate to severe abdominal tenderness, most pronounced in the epigastrium, right upper quadrant or left upper quadrant of the abdomen. Later in the disease there may be diffuse abdominal tenderness after the extravasation of bloody fluid from the pancreas into the peritoneal cavity. The patients commonly have unilateral or bilateral flank tenderness, which is rarely present in other acute conditions of the abdomen. There may also be a bluish discoloration or ecchymosis in either flank (Turner sign[6]). Rarely a bluish discoloration or ecchymosis about the umbilicus (Cullen's sign[1, 7]) may be present.

Diastatic Activity. The blood amylase becomes elevated within the first 24 hours in acute pancreatitis, but frequently remains normal for the first 12 to 18 hours. The amylase then remains elevated for 24 to 72 hours, depending upon the severity of the disease, but frequently returns to normal before clinical subsidence of the process. The urinary diastase commonly does not increase until 24 hours after the increase in blood amylase, but remains elevated 24 to 48 hours longer than the amylase. As these time elements are not constant and the reverse may occur, the authors recommend the simultaneous use of both tests in any suspected case of acute pancreatitis.

Roentgenologic Study. A plain film of the abdomen in acute pancreatitis is rarely diagnostic. It may show a segmental ileus of any section of the gastrointestinal tract, but this occurs most frequently in the transverse colon.

Blood Calcium. Blood calcium may be lowered due to the utilization of the ionizable calcium which combines with the fatty acids in the formation of calcium soaps, a process indicated by characteristic areas of fat necrosis. Recognizable lowering of the calcium occurs, however, only in the moderate and severe stages of the disease. A low level of calcium is probably most useful in diagnosis in the case of patients in the late stage of the disease, after diastatic activity has returned to normal.

TREATMENT

The treatment of choice in uncomplicated acute pancreatitis is non-surgical. The authors believe this to be extremely important in view of the mortality rate in the first series[2] reported and even more striking data in the current series. For this reason, it is important that physicians be alert for acute pancreatitis so that the diagnosis may be made clinically rather than at the time of surgical exploration.

Basic in the conservative treatment of acute pancreatitis is to put the pancreas as nearly at rest as is physiologically possible. To this end, treatment should include: (1) Continuous nasogastric suction; (2) adequate sedation; (3) adequate and regular use of atropine sulfate; (4) sufficient parenteral fluids to maintain water and electrolyte balance; (5) possible arterial antispasmodics. Following the work of Trueta[4, 5] in regard to the possible role of arterial spasm, the authors have been using paravertebral blocks, either unilateral or bilateral, depending upon the clinical location of the disease.

Intravenous novocain was used,* and more recently epidural block. Epidural block has certain advantages: It requires the use of only one injection site, and it interrupts the sympathetic as well as the sensory fibers, which gives the patient immediate relief of pain. Splanchnic block is also effective.

The use of continuous nasogastric suction produces several desirable effects: (1) Gives the patient symptomatic relief by controlling vomiting; (2) prevents the acid gastric secretions from entering the duodenum, thus reducing the hormonal stimulation of the pancreas to a minimum; (3) prevents acute gastric dilatation and helps control ileus. One important factor in the non-surgical treatment is to continue nasogastric suction for at least 24 hours after the temperature has returned to normal. When the suction is discontinued too early, acute exacerbation commonly occurs.

The fluid and caloric requirements are met by giving 3,000 to 4,000 cc. of 5 per cent glucose solutions daily. No insulin is given unless there is associated diabetes. In cases in which prolonged nasogastric suction is necessary, frequent determinations of the carbon dioxide combining power, blood sodium and potassium are made.

Atropine sulfate is given in large doses, 0.6 mg. to 0.8 mg. regularly every three to four hours. This is done to suppress the vagus effect on the pancreas. Vagus stimulation produces pancreatic juice rich in enzymes. Atropine also produces some degree of relaxation of the sphincter of Oddi. Morphine sulfate, 10.0 mg. to 15.0 mg., is given regularly to control the pain of pancreatic necrosis. The morphine also decreases the activity of the gastrointestinal tract. Penicillin given in doses of 25,000 to 100,000 units every three to four hours has been used in a small number of cases. The authors are not yet prepared to state the effectiveness of this drug in acute pancreatitis, as the number of patients treated with it is too small to have statistical significance.

Although it is felt that a cholecystogram should be made routinely following an attack of acute pancreatitis, in several cases acute exacerbation developed immediately following cholecystogram. Therefore, the authors now postpone this procedure until at least eight weeks after an acute attack.

REFERENCES

1. Cullen, T. S.: A new sign in ruptured extrauterine pregnancy, Am. J. Obs., 78:457, 1918.

2. Paxton, J. R., and Payne, J. H.: Acute pancreatitis, Surg. Gyn. & Obstet., 86:69-75, Jan. 1948.

3. Paxton, J. R., and Payne, J. H.: Symptoms of acute pancreatitis, California Medicine, 67:241-243, Oct. 1947.

4. Trueta, J.: Renal anoxia, Lancet, 2:415, Sept. 1945.

5. Trueta, J., Daniel, P., Barclay, A. E., Franklin, K. J., and Pritchard, M. L.: Renal pathology in light of recent neurovascular studies, Lancet, 2:237, Aug. 17, 1946.

6. Turner, G. G.: Local discoloration of the abdominal wall as a sign of acute pancreatitis, British J. Surg., 7:394, 1920.

7. Way, Stanley: Cullen sign, J. Obst. & Gyn. of British Empire, 48:473-486, 1941.

---

* At the suggestion of C. J. Berne, M.D.

Chronic Relapsing Pancreatitis

Dwight L. Wilbur, M.D., *San Francisco*

SUMMARY

Chronic relapsing pancreatitis is a disease of recurring acute episodes of severe upper abdominal pain which are progressive and gradually may become so severe and so frequent as to be intractable.

Early in the disease the function of the gland and of the islet tissue may be disturbed only at the time of the acute attack, but subsequently these changes may become permanent and manifested by steatorrhea, creatorrhea and diabetes mellitus. The results of studies of pancreatic function parallel those of the pathologic process, and calcification of the pancreas is common.

Medical treatment is generally disappointing. Paravertebral injections may control acute pain. Surgical therapy is none too satisfactory. Long continued biliary drainage, anastomosis between the common bile duct and duodenum and between the pancreatic duct and duodenum, section of the sphincter of Oddi, partial and total pancreatectomy and sympathectomy, splanchnicectomy and vagotomy have been helpful in relieving pain and in preventing the recurrence of attacks in some instances.

MUCH interest in acute and chronic inflammatory diseases of the pancreas has been aroused in recent years, owing largely to excellent clinical and pathological descriptions by Comfort and his associates, and to increasing experience of various surgeons with partial and total pancreatectomy and with injections of or resections of nerves in the control of the painful seizures of these diseases. Diseases of the pancreas, with the exception of those manifested by diabetes mellitus or by advanced carcinomatous changes, have generally been difficult to diagnose clinically because of the inaccessible anatomic location of the organ and of the lack of satisfactory simple tests of pancreatic function.

Various apparently unrelated forms of acute and chronic pancreatitis have been described over a period of many years, but a clear-cut clinical concept of an entity now frequently called "chronic relapsing pancreatitis" was not developed until Comfort, Gambill and Baggenstoss in 1946 presented their studies of 27 such cases. They pointed out that this disease manifests itself by recurring attacks of pain, usually in the upper part of the abdomen, by disturbances of function of acinar and islet cells, and by certain sequelae.

Chronic relapsing pancreatitis is not a common disease (approximately 20 cases were encountered each year in the early 1940's at the Mayo Clinic) but it is now more frequently recognized than it was formerly. Curiously, it predominates in the male (6:1), and patients who have the disease are usually not obese. In these last two respects it differs from disease of the biliary tract. It is more common in patients in middle age (median 37 years) and in alcoholics.

ETIOLOGY AND PATHOLOGY

The cause of chronic relapsing pancreatitis is not clear and there has been wide discussion of the relation of it to disease of the gallbladder, bile ducts, and liver. Recent studies of Gambill, Comfort and Baggenstoss have indicated that the clinical picture, pathologic physiology, the course of the disease and the pathologic alterations in the pancreas in cases of chronic relapsing pancreatitis are very constant, regardless of the presence or absence of disease of the biliary tract. These findings, as well as the differences between the two diseases with regard to sex incidence and the presence of obesity, strongly suggest that pancreatitis is not necessarily secondary to disease of the biliary tract but may be and frequently is independent of it.

Baggenstoss has shown that grossly the pancreas, in cases of chronic relapsing pancreatitis, is indurated and sometimes nodular, and that, microscopically, fibroblastic proliferation and fibrosis are prominent features. Gross atrophy of the gland, pseudocyst formation and macroscopic calcification are characteristic of the disease. Interstitial fibrosis and residual necrosis of tissue are other constant findings. Fibrosis is usually interlobular, although intralobular and intra-acinar fibrosis occur. Infiltration with lymphocytes and plasma cells is common, but actual suppuration is rare. Insofar as associated changes in the bile ducts are concerned, it appears that this form of pancreatitis may be responsible for dilation of the gallbladder, and that the degree of pathologic change in the gallbladder and ducts bears some relationship to the extensiveness and activity of the disease in the pancreas.

SYMPTOMS

Recurring, acute, severe, prolonged exacerbations of upper abdominal pain, separated by intervals of

---

Read as part of a Symposium on Diseases of Gastrointestinal Tract before a joint meeting of the Sections on General Surgery, General Practice, Radiology and General Medicine at the 78th Annual Meeting of the California Medical Association in Los Angeles, May 8-11, 1949.

From the Department of Medicine, Stanford University School of Medicine, San Francisco.

relative or complete clinical quiescence, are characteristic of the disease. Pain is the outstanding clinical feature of the acute attack. The pain may begin gradually or suddenly, is generally in the upper abdomen, is severe, is prolonged (from several hours to several days), is variable in type but usually steady, and frequently and characteristically it radiates to the left upper quadrant of the abdomen and to the back. Often, repeated doses of opiates are needed for relief, and not infrequently the patients become addicted to opiates. The interval between attacks varies greatly; it may be years in the early stages of the disease. Usually as the disease progresses the intervals shorten and become marked by persisting digestive symptoms, signs of disturbance in pancreatic function, and at times by diabetes mellitus. In short, the disease tends to be progressive, the attacks becoming more frequent, more prolonged and more severe.

Accompanying the pain are variable symptoms of gastrointestinal dysfunction such as nausea, vomiting, constipation or diarrhea, abdominal distention, jaundice, bleeding and such general symptoms as weakness, fever, sweating and shock.

In the interval between attacks there are frequently no symptoms in the early stages of the disease. Later on, various non-specific clinical syndromes may develop with symptoms including intolerance to fatty foods, flatulence, weakness, constipation, anorexia and epigastric distress.

In approximately half of the cases observed by Comfort, Baggenstoss and Gambill, pronounced permanent sequelae including diabetes, steatorrhea and calcification of the pancreas were present and observable in the interval between acute painful exacerbations of the disease.

DIAGNOSIS

The diagnosis of chronic relapsing pancreatitis may be simple in a typical case when all of the characteristic features are present. On the other hand it may be extremely difficult in the patient whose only manifestation of the disease has been recurring attacks of upper abdominal pain.

The most useful diagnostic feature in the history is that of recurring, severe, protracted upper abdominal pain with features previously noted. Associated symptoms excepting jaundice are usually non-specific and in keeping with any severe abdominal pain due to an acute inflammatory process. Addiction to opiates may be present.

Physical examination during an attack may reveal moderate fever, epigastric tenderness and rigidity and jaundice. "The appearance of a rounded cystic mass in the pancreatic region during the painful seizure or soon thereafter may have the same significance as does diabetes mellitus, steatorrhea or calcification." (Gambill and co-workers.) In the interval between attacks examination may disclose no abnormality except for evidence of weight loss and epigastric tenderness.

Laboratory data obtained during an acute attack may reveal leukocytosis, acceleration of the sedimentation rate and evidence of jaundice. Glycosuria and transient hyperglycemia are infrequent unless diabetes mellitus is present. The following phenomena, if present, are useful in substantiating the diagnosis: Elevation of values for amylase and lipase in the serum and of the value for fecal solids, fat and nitrogen in the stool by chemical analysis, grossly fatty stools and excessive amounts of fat by microscopic examination. Even during an acute attack, however, results of tests mentioned may be within normal limits. In some cases in which accurate studies can be made of the volume and of the bicarbonate and enzymatic concentration of duodenal content after stimulation with secretin, the finding of values lower than normal may be useful to substantiate the diagnosis. Negative results of tests do not exclude the disease.

Roentgenologic studies are useful in ruling out other causes of severe abdominal pain in the stomach, duodenum, colon and gallbladder. They may also reveal multiple areas of calcification throughout the pancreas and, in fact, the gland may appear largely calcified. Abnormalities in the appearance of, or in the peristaltic activity of the stomach or duodenum in those areas where they are contiguous with the pancreas, may be a useful confirmatory diagnostic help in an occasional case.

Finally, the course followed by the patient may be diagnostically important because it may be typical—recurring acute, severe, prolonged, upper abdominal pain associated with transient elevations in value of serum lipase or amylase, and perhaps hyperglycemia and glycosuria during the attack, generally followed over a period of years by more severe and more prolonged attacks of pain, by prominent physiological alterations in glucose metabolism and by development of steatorrhea and creatorrhea. Such a pattern generally establishes the diagnosis. If in addition radiological evidence of calcification of the pancreas is found, the diagnosis is clear.

In many patients with this disease the diagnosis is not established until operation is performed. In fact, in over half the cases the correct diagnosis is not made preoperatively. It is particularly liable to be missed in those cases in which symptoms resemble those of biliary tract disease — namely, jaundice and colics—and there is no laboratory evidence of pancreatic disease.

TREATMENT

Treatment of the attack of acute pancreatitis is generally considered a medical problem, whereas surgical treatment may be advisable and helpful in managing the patient with recurring attacks of pain or with associated disease in the biliary tract.

Medical: Medical treatment of the acute attack is largely symptomatic and consists of administration of ephedrine sulfate, papaverine hydrochloride or opiates, and of intravenous administration of fluids, of decompression of the upper gastrointestinal tract and control of shock if these measures are necessary.

Between episodes and when the disease becomes chronic, medical treatment consists of high caloric, high carbohydrate, low fat diet, control of diabetes if it is present, and avoidance of alcohol. Extract of the whole pancreas in doses of 5 gm. in enteric-coated tablets with each meal may help greatly in reducing abdominal discomfort and increasing absorption of food.

Surgical: In discussion of surgical treatment of chronic relapsing pancreatitis, consideration must be given to the end to be accomplished. The principal problem may be any of the following: To relieve the acute attack of pain, to attempt to prevent recurrence of severe attacks of pain, to improve pancreatic function, to relieve accompanying jaundice, or to remove associated disease of the biliary tract.

For the control of pain in the immediate attack, paravertebral block, with novocain, of the sixth to tenth dorsal segments has been advocated by deTakats and Walter, White and Smithwick, and others. Properly carried out, this method appears to be very effective, although it may have to be repeated several times during an acute episode. While this method of treatment would appear largely to control pain only and not to influence the disease process in the pancreas, some advocates of it believe that because spasm of the sphincter of Oddi may be relieved, promoting drainage from the pancreas, the method may actually affect the pathologic process.

Other more time-honored surgical methods of control of acute attacks, as well as of the lesion, include cholecystostomy with prolonged drainage and cholecystectomy with prolonged (six to 12 months) drainage of the common bile duct by a T-tube. It must be readily appreciated, however, that when drainage of the biliary tract is discontinued the pathologic process of the pancreas may progress and symptoms reappear.

Surgical procedures which have been recommended to control recurrent attacks of pain and to improve pancreatic function, and which are therefore most useful in the earlier stages of the disease, include choledochoduodenostomy, which has been particularly advocated by Waugh, and section of the sphincter of Oddi. The latter method, which has recently been applied in 21 cases by Doubilet and Mulholland, is carried out by an approach through the common duct or by opening the duodenum and directly sectioning the muscle over a probe. The rationale of this procedure goes back to the original suggestion of Archibald, that spasm of the sphincter of Oddi in the presence of a common biliary-pancreatic passageway and reflux of bile into the pancreas is a significant etiologic factor in acute pancreatitis.

Two other surgical procedures advocated for the disease include anastomosis of the dilated pancreatic duct to the duodenum, as reported by Crile, and ligation of the pancreatic duct, which according to Martin and Canesco is a treatment of choice at the Johns Hopkins Hospital Clinic. Crile states that the anastomotic procedure has given relief to approximately 50 per cent of patients operated upon and is therefore not a specific cure. The other procedure, ligation of the duct, leads to atrophy of the pancreatic acini without accompanying atrophy of the islands of Langerhans.

Finally, for those patients with extensive disease of the pancreas, manifested chiefly by recurring, severe, almost uncontrollable pain, the two most commonly advocated procedures include partial or total pancreatectomy and section of the sympathetic and/or parasympathetic nerve fiber supplying the pancreatic area. Whipple recently (1946) collected reports of 12 cases of total pancreatectomy from the literature and added two of his own. While this a heroic procedure with a great morbidity and high mortality rate, it would appear to be justified in an occasional patient with intractable pain who is perhaps already diabetic. Before carrying out such an extensive procedure, consideration should be given to a less serious operation such as section of nerves. Crile, deTakats and Walter, and others, have advocated ganglionectomy on the right side (seventh to twelfth dorsal) with or without resection of the right splanchnic nerve. While Rienhoff and Baker have reported section of both splanchnic nerves and both vagi with striking relief of pain, there is question whether in all cases such an extensive surgical procedure is necessary.

655 Sutter Street.

REFERENCES

1. Archibald, E.: Experimental production of pancreatitis in animals as result of resistance of common duct sphincter, Surg. Gyn. & Obst., 28:529, June 1919.
2. Baggenstoss, A. H.: Chronic relapsing pancreatitis: A review of the pathologic anatomy in cases in which disease of the biliary or gastrointestinal tract did not coexist, Proc. Staff Meeting Mayo Clinic, 22:542-547, Nov. 26, 1947.
3. Comfort, M. W., Gambill, E. E., and Baggenstoss, A. H.: Chronic relapsing pancreatitis, Gastroenterology, 6:239, and 376-408, May and June, 1946.
4. Crile, G., Jr.: Diseases of the pancreas and lower biliary tract, Kansas City Med. J., 25:7-12, March-April, 1949.
5. deTakats, G., and Walter, L. F.: The treatment of pancreatic pain by splanchnic nerve resection, Surg. Gyn. Obst., 85:742-746, December 1947.
6. Doubilet, H., and Mulholland, J. H.: Recurrent acute pancreatitis: Observations on etiology and surgical treatment, Ann. Surg., 128:609-638, October 1948.
7. Gambill, E. E., Comfort, M. W., and Baggenstoss, A. H.: Chronic relapsing pancreatitis: An analysis of 27 cases associated with disease of the biliary tract, Gastroenterology, 11:1-33, July 1948.
8. Martin, L., and Canesco, J. D.: Pancreatic calculosis, J.A.M.A., 135:1055-1060, Dec. 20, 1947.
9. Rienhoff, W. F., Jr., and Baker, B. M.: Pancreolithiasis and chronic pancreatitis, J.A.M.A., 134:20-21, May 3, 1947.
10. Waugh, J. M.: Chronic relapsing pancreatitis: Surgical management, Proc. Staff Meeting Mayo Clinic, 22:558-560, Nov. 26, 1947.
11. Whipple, A. O.: Radical surgery for certain cases of pancreatic fibrosis associated with calcareous deposits, Ann. Surg., 124:99-108, December 1946.

The Clinical Significance of Urinary 17-Ketosteroid Assays

Gerson R. Biskind, M.D., *San Francisco*

SUMMARY

The urinary 17-ketosteroids are a group of compounds derived from complex steroids produced by the adrenal cortex, testis, or ovary. The method of determining the amount excreted has been simplified so that it is available for routine diagnostic purposes. Usually the amount is increased in diseases in which there is hyperfunction of the adrenal cortex due to tumor or hyperplasia, and decreased in lesions that impair the function of the adrenal cortex.

Other conditions such as myxedema, eunuchism, gout, and arthritis may alter the excretion of the 17-ketosteroids. Low levels are also found in the young and in the aged. Case histories are presented to illustrate the findings in the following diseases: Tumors of the adrenal cortex with (a) masculinization, (b) Cushing's syndrome with virilism and, (c) hirsutism; as well as in gigantism with acromegaly, in gout, eunuchism, Addison's disease, myxedema, and severe panhypopituitarism.

RECENT progress in the understanding of steroid metabolism has made the assay of urinary neutral 17-ketosteroids an important test in the evaluation of certain clinical conditions related to the endocrine system. This review will attempt to analyze briefly the current concepts concerning the origin, nature, and significance of these compounds, and will illustrate by means of case reports most of the conditions in which there is a definite abnormality in the 17-ketosteroid excretion.

The steroids present in the urine can be divided into neutral, phenolic, and acidic compounds (Diagram No. 1). The acidic steroids represent the bile acids; the phenolic are mainly the estrogens. The neutral steroids contain metabolites from the testes or ovaries and from the adrenals. There are four important groups of compounds present in the adrenal cortex that give rise to neutral steroids in the urine. These are: (1) androgenic substances, (2) progesterone, (3) desoxycorticosterone, (4) corticosterone. The testicular hormone, testosterone, is the precursor of some of the neutral 17-ketosteroids in the urine.

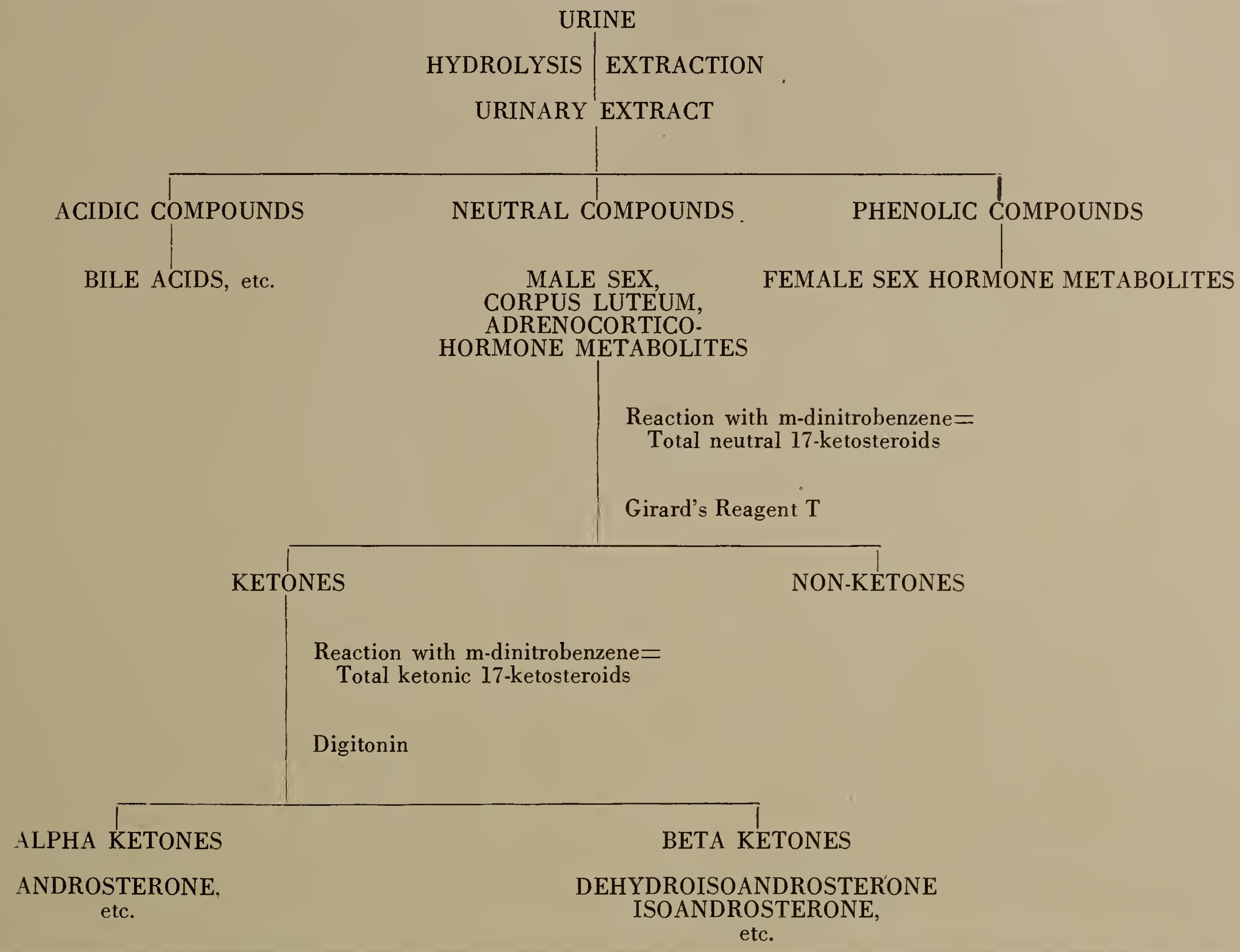
The neutral steroids in the urine can be subdivided into the ketonic and the nonketonic fractions. The latter are relatively small in quantity and are usually derivatives of progesterone and desoxycorticosterone. The more important ketonic fraction is composed of the following: Isoandrosterone from the testis, dehydroisoandrosterone from the adrenal cortex, and androsterone and other complex steroids that are metabolites from both adrenal cortex and testis.

The basic principles underlying the assay of neutral urinary 17-ketosteroids are not complex.[5] However, the actual technique is moderately involved and requires careful attention to details. The steroid metabolites in the urine are rapidly converted by hydrolysis to the free compounds by boiling with a strong inorganic acid. The steroids are extracted from the urine by means of an organic solvent. In some techniques, hydrolysis and extraction may be performed simultaneously. The estrogens are removed from the extract by washing with a weak alkali. The remaining extract is dried, dissolved in alcohol, and assayed by reacting it with m-dinitrobenzene.[8] The red color resulting from this reaction is compared with the color produced by a known amount of dehydroisoandrosterone. This determines the total neutral 17-ketosteroid content of the urine. Instead of the chemical reaction, a biologic test for androgenic activity may be substituted; however, the neutral 17-ketosteroids include substances that are not androgens, so that a direct correlation between androgenic activity and 17-ketosteroid content is not always evident. If more accurate determinations are required, the extract is treated with Girard's reagent T to separate the ketonic from the nonketonic fractions. In the normal individual the amount of nonketonic material is not sufficient to require this complex procedure. The total ketonic portion can be measured by means of the m-dinitrobenzene reaction, or it can be treated with digitonin to separate the alpha from the beta compounds. Androsterone represents the major portion of the non-precipitable alpha 17-ketosteroids. The principal component of the digitonin-precipitable beta 17-ketosteroids is dehydroisoandrosterone, and it is derived only from the adrenal cortex. In urine from normal individuals the beta fraction rarely exceeds 10 per cent of the total amount of the ketonic ketosteroids. In males the hormones of the testis give rise to about one-fifth, and the hormones

---

Chairman's Address: Presented before the Section on Pathology and Bacteriology at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

Diagram No. 1


URINE
HYDROLYSIS
EXTRACTION
URINARY EXTRACT
ACIDIC COMPOUNDS
NEUTRAL COMPOUNDS
PHENOLIC COMPOUNDS
BILE ACIDS, etc.
MALE SEX, CORPUS LUTEUM, ADRENOCORTICO-HORMONE METABOLITES
FEMALE SEX HORMONE METABOLITES
Reaction with m-dinitrobenzene= Total neutral 17-ketosteroids
Girard's Reagent T
KETONES
NON-KETONES
Reaction with m-dinitrobenzene= Total ketonic 17-ketosteroids
Digitonin
ALPHA KETONES
BETA KETONES
ANDROSTERONE, etc.
DEHYDROISOANDROSTERONE ISOANDROSTERONE, etc.

of the adrenal cortex to most of the rest of the 17-ketosteroid excretion. In females most of the 17-ketosteroids are derived from the hormones of the adrenal cortex.

The values for the 17-ketosteroids assayed in 24-hour urine specimens, obtained from adult normal individuals, fall within the following ranges: Males, 8 to 22 mg.; females, 6 to 13 mg. The amounts in children are variable. Up to two or three years of age none is present; from 3 to 8 years there may be as much as 2 mg.; from 8 to 12 years there are between 1.5 and 5 mg.; from 12 to 16 years the amount varies between 4.5 and 9.5 mg.

Increased amounts of 17-ketosteroids in the urine may be found in certain endocrine diseases. The most important and most common is the functioning tumor of the adrenal cortex. These tumors produce a variety of clinical syndromes that have been classified by Kenyon[4] into: (1) the adrenogenital syndrome; (2) Cushing's syndrome; (3) mixed clinical pictures having features common to the first two; (4) isolated expressions of the neoplasm; (5) feminization in adult males and rarely in children; (6) tumors without endocrine manifestations.

In instances of adrenal tumor with clinical evidence of intense masculinization, the 24-hour 17-ketosteroid excretion varied from 76 to 857 mg., and, where measured, the beta fraction varied between 30 and 79 per cent. In the reported cases, ten of the patients were females and one was a male.[2] The following case report lists an additional instance of typical masculinizing tumor of the adrenal cortex with an extremely high 17-ketosteroid excretion in which the beta fraction represented 25 per cent.

CASE REPORT*

Case 1: The patient was a white female, 63 years of age, with clinical diagnosis of masculinizing tumor of the right adrenal gland. Virilization had begun 30 years previously, after the last pregnancy, characterized by increase in growth of hair on face and body, baldness, amenorrhea, muscular shoulders and arms, and enlargement of the clitoris to three times normal size. The systolic blood pressure was 200 mm. of mercury, the diastolic, 100 mm. The glucose tolerance test revealed the following blood sugar levels in mg. per 100 cc.: Fasting, 95; 30 minutes, 200; 60 minutes, 258; 120 minutes, 285; and 180 minutes, 219. Intravenous pyelograms showed no abnormality. A large encapsulated adenoma, 17.5 by 12 by 8.5 cm., that had replaced the right adrenal gland was removed on December 8, 1948, after inspection of the normal left adrenal gland and the atrophic pelvic organs. The following assays were performed:

Oct. 27, 1948: Total neutral 17-ketosteroids, 455.7 mg. per 24 hours.

---

* Courtesy of Roberto F. Escamilla, M.D.

Nov. 5, 1948: Total neutral 17-ketosteroids, 661.0 mg. per 24 hours.
Nov. 5, 1948: Total ketonic 17-ketosteroids, 663.0 mg. per 24 hours.
Alpha fraction, 571.0 mg.
Beta fraction, 170.0 mg. (25%)
Dec. 8, 1948: Surgical removal of adenoma of right adrenal gland.
Dec. 17, 1948: Total neutral 17-ketosteroids, 15.8 mg. per 24 hours.
Jan. 19, 1949: Total neutral 17-ketosteroids, 9.1 mg. per 24 hours.
Feb. 18, 1949: Total neutral 17-ketosteroids, 10.0 mg. per 24 hours.
Mar. 25, 1949: Total neutral 17-ketosteroids, 5.6 mg. per 24 hours.

In another case of masculinizing tumor of the adrenal cortex, the 17-ketosteroid excretion was elevated but not to such high levels:

CASE REPORT*

CASE 2: The patient, a white female 63 years of age, had a clinical diagnosis of masculinizing tumor of the left adrenal gland. In the preceding five years the patient had become bald with a masculine distribution of facial and body hair, and masculine musculature. A carcinoma of the right breast had been removed in 1944. At that time the blood pressure varied between 230 and 260 mm. of mercury systolic, and 125 and 142, diastolic. A 68-gram tumor was removed from the left adrenal gland on May 28, 1948. Subsequently the body hair slowly disappeared. The blood pressure remained elevated and at present there is evidence of hypertensive heart disease, early congestive failure, with fatigue and dyspnea, but no evidence of masculinization. The 24-hour total neutral 17-ketosteroid outputs were: May 15, 1948, 90 mg.; June 14, 1948, 1.5 mg.; April 18, 1949, 11.4 mg.

There are published reports of cases of tumors of the adrenal cortex that produced the Cushing syndrome and practically no virilism. In these cases the ketosteroid excretion paralleled that in the first group, varying from 19.9 to 800 mg., but in seven of the 13 cases reported, it was less than 75 mg. In three of the cases the beta fraction was less than 22 per cent of the total, but in two other cases the percentage was 65 and 69.[2]

There are 23 published reports of cases of tumor of the adrenal cortex in which there were masculinization and manifestations of Cushing's syndrome, and in these cases the excretion of urinary 17-ketosteroids was extremely variable but always above normal.[2] The following is a case that may be classified in this group:

CASE REPORT†

CASE 3: The patient was a white female, 39 years of age. The clinical diagnosis was Cushing's syndrome with virilism due to adrenal tumor. The following signs and symptoms were evident: extreme weakness of legs, moon face, plethoric countenance, exophthalmos, disproportionately thin extremities without obesity, easy bruising, amenorrhea, hirsutism, acne, hypertension (the blood pressure was 180 mm. of mercury systolic and 120 mm. diastolic), generalized osteoporosis, diabetic reaction to a glucose tolerance test, high 11-oxysteroids (2.92 mg.), and low eosinophil count. The total neutral 17-kerosteroid excretion was 62.4 mg. in 24 hours. The intravenous pyelograms showed no abnormalities, but perirenal gaseous insufflation revealed a tumor over the left kidney. The patient died on the fifth day of cardiac failure and pulmonary edema after surgical removal of an encapsulated tumor in the left adrenal.

There are instances of Cushing's syndrome that have been proved not to be due to a tumor of the adrenal cortex, and in those instances the 17-ketosteroid excretion varied between 7 and 37 mg. In at least half of the cases the amount extracted was within normal limits. In a few cases where the beta fraction was determined, it was 14 per cent or less.[2]

The assay of 17-ketosteroids offers some help in the differentiation of tumor from hyperplasia of the adrenal cortex. In the latter condition in females, there may be prepubertal virilism, often associated with pseudohermaphroditism or sex inversion, or postpubertal virilism that is characterized mainly by hirsutism. In the females in whom hirsutism develops after puberty, the 17-ketosteroid excretion is normal or does not exceed 37 mg. in 24 hours.[2] In the prepubertal cases, an increased excretion is more common, but it is usually under 100 mg. and the beta fraction is less than 23 per cent in 24 hours. In cases of tumor of the adrenal cortex with virilizing signs the excretion of 17-ketosteroids is often more than 100 mg. in 24 hours and the beta fraction is over 20 per cent. If in the presence of virilism there are, in addition, elements of the Cushing syndrome, there is usually a definite increase in the cortin content of the urine. In the following case, hirsutism that appeared in a girl at the age of 11 was the single endocrine expression of an adrenal tumor:

CASE REPORT‡

CASE 4: The patient was an Indian female, 28 years of age. The clinical diagnosis was hirsutism due to malignant adenoma of the left adrenal gland. The patient said that she had had excessive hair on the body since she was 11 years of age. An increased amount of hair over the chest, legs, and face, and a masculine distribution of pubic hair on the abdomen were noted. The voice was normal. The systolic blood pressure was 120 mm. of mercury, the diastolic 84 mm. Roentgenographic studies suggested a mass in the region of the left adrenal gland. The basal metabolic rate was plus 5 per cent. A malignant adenoma of the adrenal gland was removed Aug. 7, 1947. There has been relatively little change in the amount of body hair since the operation. Results of a series of total neutral 17-ketosteroid assays of 24-hour urine specimens were: May 7, 1947, 82.1 mg.; May 10, 62.2 mg.; September 11, 1947, one month after surgical removal of a malignant adenoma of the adrenal gland, 6.3 mg.; November 14, 10.2 mg.; February 4, 1948, 13.5 mg.; April 3, 19.2 mg.; August 10, 8.6 mg.

There are reports of nine cases of virilizing tumors of the ovary. In three of the cases the tumors were arrhenoblastomas, in three they were adrenal-like tumors, and in three the tumors were not described.[2] The patients that had arrhenoblastomas excreted 4.0 mg., 6.9 mg., and 56 mg. of 17-ketosteroids in 24 hours; the patients with adrenal-like ovarian tumors excreted 17 mg., 23.8 mg., and 54.6 mg. In the other three cases excretion levels were 40 mg., 116 mg., and 158 mg. The excretion was measured after operation in four cases and in each it dropped to normal or subnormal levels.

---

* Courtesy of Kendall B. Holmes, M.D., Fresno.
†Courtesy of Minnie Goldberg, M.D.
‡Courtesy of Hans Lisser, M.D.

There may be a subnormal, normal, or increased excretion of 17-ketosteroids in cases of acromegaly.[3] The following case report illustrates a combination of gigantism with early acromegaly:

CASE REPORT*

CASE 5: The patient was a white male, 41 years of age. The clinical diagnosis was eunuchoid gigantism with features of acromegaly. The height of the patient was 87 inches, the span 92 inches, and the weight 342 pounds. Roentgenograms revealed prognathism and slight tufting of the ends of the phalanges. There was atrophy of the testes. The 24-hour excretion of total neutral 17-ketosteroids was 9.2 mg.

The possible relationship of some diseases of the joints to the endocrine system has been suggested by the 17-ketosteroid excretion levels in gout and in spondylarthritis. A recently published report has brought out the fact that the 17-ketosteroid excretion is diminished in gout.[7] This has been confirmed in one case:

CASE REPORT†

CASE 6: The patient, a 31-year-old white male, with known polycythemia, had a first attack of gout on October 6, 1948. The blood uric acid concentration was 12.6 mg. per 100 cc. The patient was treated with colchicine. On October 26, 1948, neutral 17-ketosteroid excretion in the urine in a 24-hour period was 6.9 mg. Several attacks of gout occurred in the succeeding six months, and during one of these urate crystals were demonstrated in tophi.

It has been reported that in 31 cases of spondylarthritis in males the excretion of neutral 17-ketosteroids varied from 10 to 43.5 mg. The average was 26.7 mg. In four females with this disease outputs were 19.5 mg., 40 mg., 23 mg., and 16 mg.[1]

There is a significantly lowered excretion of 17-ketosteroids in the young and in the aged, as well as in persons with malnutrition, anemia, and chronic debilitating disease.[3] Severe physical stress produces an increased excretion that may be followed by a diminished output.[6] Acute trauma such as is produced by fractures, surgical operation, or the onset of acute febrile disease may be followed for a short time by a rise in 17-ketosteroid excretion. In some instances of chronic hepatic insufficiency the level is decreased. The administration of purified adrenocorticotropic hormone to normal males and females induces a distinct increase in the 17-ketosteroid excretion. In hypogonad males usually there is a diminished excretion[3] as is shown in the following report:

CASE REPORT‡

CASE 7: The patient, a white male, 55 years of age, had been surgically castrated following severe trauma at age 22. Since then he had had decreased libido, diminution in amount of beard, axillary and pubic hair, and loss of strength. Examination revealed recently acquired obesity, gynecomastia, pigmentation of the face with wrinkling of the skin, and normal blood pressure. The basal metabolic rate was zero, the cholesterol content of the blood serum was 222 mg. per 100 cc. The total neutral 17-ketosteroid excretion on two examinations was 3.3 mg. and 4.6 mg. in 24 hours.

There are three outstanding diseases in which there is a decreased excretion, often severe, of 17-ketosteroids. These are anterior pituitary insufficiency, Addison's disease, and myxedema. The 17-ketosteroid output in the presence of these diseases is usually less than 6 mg., the lowest levels occurring in the first two. In some instances urinary gonadotropin assays are required to distinguish between cases of primary hypophyseal disease with features of adrenal insufficiency and those of primary adrenal failure. Treatment of myxedema with desiccated thyroid usually does not elevate the subnormal excretion of 17-ketosteroids, nor does the maintenance of a patient in good clinical condition with Addison's disease by means of desoxycorticosterone and adrenal cortex extract.

The following case reports illustrate the clinical and laboratory findings in typical instances of these three diseases.

CASE REPORTS

CASE 8:* The patient was a white male, aged 42 years. The clinical diagnosis was panhypopituitarism: "burnt-out" acromegaly with hypogonadism, myxedema and severe Addison's disease. The patient entered the hospital in Addisonian crisis. Roentgenographic examination showed a large sella, tufting of the terminal phalanges and prognathism. The testes were atrophic, and biopsy revealed tubular degeneration. The prostate was minute. The skin of the face was fawn-colored. The basal metabolic rate was minus 24 per cent. Urinary excretion of the follicle-stimulating hormone was less than 5 mouse units in 24 hours. The urinary excretion of neutral 17-ketosteroids on March 24, 1948, was 2.6 mg. per 24 hours. The patient was treated for the acute Addisonian crisis and finally stablized on thyroid extract, testosterone propionate and 4 mg. of desoxycorticosterone acetate daily. On this regimen he returned to lumberjacking. The total neutral 17-ketosteroid excretion on April 29, 1949, was 2.1 per 24 hours.

CASE 9:† The patient, a white male, 49 years of age, with a clinical diagnosis of tuberculosis of the adrenal glands, entered the hospital in Addisonian crisis. The Robinson-Power-Kepler tests No. 1 and No. 2 showed positive results. The urinary excretion of neutral 17-ketosteroids on Dec. 7, 1948, was 1.2 mg. in 24 hours. The patient was treated in the usual manner and stabilized on salt and desoxycorticosterone acetate. After he had resumed normal physical activity, the 17-ketosteroid assay on February 7, 1949, was 4.2 mg. in 24 hours. He died unexpectedly and autopsy revealed bilateral caseous tuberculosis of the adrenal glands; direct extension of the tuberculous process from the left adrenal to the spleen, with miliary dissemination in the liver.

CASE 10:‡ The patient was a white male, 67 years of age, with clinical diagnosis of myxedema. He complained of extreme fatigue for the previous six months, coldness of the hands and feet, pain in the hands associated with stiffness, and a gain in weight of 20 pounds. On examination the skin was dry, the face was puffy and pale, there was swelling of the hands and feet, and the tongue was thick. The basal metabolic rate was minus 41 per cent. The cholesterol content of the blood serum was 333 mg. per cent, and the iodine level of the blood was 3.2 micrograms per cent. The total neutral 17-ketosteroid excretion was 4.8 mg. in 24 hours.

---

* Courtesy of Drs. Sanford E. Leeds and Morton J. Nyda.
† Courtesy of Harris M. Fishbon, M.D.
‡ Courtesy of Myron Arrick, M.D.

* Courtesy Veterans Administration Hospital, Ft. Miley, San Francisco.
† Courtesy of Russel F. Rypins, M.D.
‡ Courtesy of Roberto F. Escamilla, M.D.

240 Stockton Street.

REFERENCES

1. Davidson, R. A., Koets, P., and Kuzell, W. C.: Effect of roentgenotherapy on urinary 17-ketosteroid excretion in ankylosing spondylarthritis, Journ. Clin. End., 9:79-88, January 1949.

2. Engstrom, W. W.: Nature and significance of neutral steroids in human urine in normal and abnormal states, Yale Journal of Biology and Medicine, 21:21-85, October 1948.

3. Escamilla, R. F.: Diagnostic significance of urinary hormonal assays: Report of experience with measurements of 17-ketosteroids and follicle stimulating hormone in the urine, Annals of Internal Medicine, 30:249-290, February 1949.

4. Kenyon, A. T.: Adrenal cortical tumors—physiologic considerations, Surgery, 16:194-232, January 1944.

5. Pincus, G.: The analysis of urines for steroid substances, Journ. Clin. Endo., 5:291, September 1945.

6. Pincus, G.: Studies of the role of the adrenal cortex in the stress of human subjects, Recent Progress in Hormone Research, 1:123, 1947.

7. Wolfson, W. Q., Guterman, H. S., Levine, R., Cohn, C., Hunt, H. D., and Rosenberg, E. F.: An endocrine finding apparently characteristic of gout: Very low urinary 17-ketosteroid excretion with clinically normal androgenic function, Journ. Clin. Endo., 9:497-513, June 1949.

8. Zimmermann, W.: Eine Farbreaktion der Sexualhormone und ihre Anwendung zur quantitativen colorometrischen Bestimmung, Ztschr. f. physiol. Chem., 233:257, 1935.

* * *

Liquid Nitrogen in the Treatment of Skin Diseases

H. V. Allington, M.D., *Oakland*

SUMMARY

Liquid nitrogen is a satisfactory freezing agent in the treatment of such skin diseases as warts, keratoses, superficial hemangiomas, leukoplakia, keloids, superficial scarring and dermatitis venenata. It is available and easily applied. Its use is described and the results of treatment in 154 cases of warts are presented.

There have been several articles, the most recent one by Kile and Welch,[1] on the use of liquid gases as cryotherapeutic agents in dermatology. This presentation will briefly review some of the practical aspects of this method of treatment.

Liquid air was the first gas used and may still be used. It contains approximately 78 per cent nitrogen, 21 per cent oxygen, 1 per cent argon and traces of other rare gases.

In recent years the commercial demand for oxygen and nitrogen has led to the production of these elements in almost pure form and in tremendous quantities. The process of manufacture includes the compression and the refrigeration of atmospheric air and then its fractional distillation and chemical rectification.

Because of its easy availability liquid oxygen has been used for a number of years and still is often used. Recently, as liquid nitrogen has become more commonly available, it has partially replaced liquid air or liquid oxygen. It has the advantage of being largely inert and avoids the fire hazard inherent in liquid oxygen. Its only disadvantage is perhaps that it is approximately 13° C., or 7 per cent, colder than liquid oxygen and therefore is lost slightly more quickly by vaporization. This is of little practical importance, however.

The liquid nitrogen used in the Student Health Service clinic at the University of California, Berkeley, is obtained from the physics department in a quart-sized thermos bottle. This is surrounded by cotton waste and set in a plywood box measuring about eight inches square and 12 inches deep. The open mouth of the glass container is covered by a half-inch layer of orthopedic felt. Each clinic morning approximately a quart of the liquid nitrogen is obtained. This has been used in treating as many as 21 cases of warts during a clinic period. Much of the liquid nitrogen is left in the container at the end of the clinic.

For office use the author obtains liquid nitrogen—2.5 liters in a special 5-liter container—from a commercial source. From this container the nitrogen is poured as it is needed into a pint thermos bottle surrounded by cotton waste and enclosed in a small plywood box. This box is provided with a handle for ease in carrying it about the office. The supply is obtained twice a week, on Monday and Thursday mornings, and the rate of evaporation with this care is such that it is usually available continuously throughout the week.

The liquid nitrogen is applied by means of an ordinary cotton swab or applicator stick. In order to pick up the liquid nitrogen, it is important not to wrap the cotton too tightly on the applicator. This is dipped into the liquid and applied to the lesion to be treated. No appreciable pressure is required for most lesions, and freezing is almost instantaneous.

Lesions of considerable depth, such as warts on the palmar or plantar surfaces, require several seconds to become frozen to their whole depth. Pronounced hyperkeratosis results in slower freezing since cornified epidermis is a good insulator for heat and cold.

In applying liquid nitrogen to a small lesion, it is usually necessary to interrupt contact with the applicator. If this is not done, freezing proceeds rapidly to a greater depth and particularly to a greater width than is needed. Thus the treatment usually consists of touching the growth intermittently often enough and long enough to confine the freezing to the area desired for as long a period as required. Often if there are two or three lesions in close proximity, they can be treated coincidentally by alternately transferring the applicator saturated with the liquid nitrogen from one to the other. The desired depth and width of freezing can be determined by the appearance of the lesion, since the area actually frozen is white and easily visible.

The time required to freeze a lesion adequately varies with its depth and thickness, its size and character. To one familiar with this method, accurate timing may not be necessary. However, results are apt to be more uniformly successful if a lesion to be treated is first "sized up" and then the determined period of freezing timed. The time is measured as the period during which the liquid nitrogen is actually being applied. It usually takes fully as long and sometimes longer for the frozen lesion to

---

Chairman's Address: Presented before the Section on Dermatology and Syphilology at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

From E. V. Cowell Memorial Hospital, Student Health Service, University of California, Berkeley.

thaw out after the application has been discontinued. No hidebound timing schedule can be outlined. In treating hemangiomas, a period of ten seconds or less may be enough, and more intense freezing may predispose to ulceration. However, in most lesions a period of from 15 to 60 seconds will be used. For small superficial lesions on thin delicate skin such as that on the face and the dorsum of the fingers and hands, and of the forearms in children, 15 or 20 seconds may suffice. Juvenile plane warts and early keratoses may be treated in this manner. Lesions on the tougher thicker skin of most adults, especially on the palmar or plantar surface, require the longer periods. Common warts on the back of the hands, for example, may require 30 seconds. For most lesions on the palmar surface, from 45 to 60 seconds is necessary. If the lesion is cornified or imbedded as are warts on the grasping surfaces, 60 to 90 seconds may be required. Plantar warts are not often treated with liquid nitrogen because their depth makes adequate freezing difficult even with prolonged application.

The freezing produces stinging pain which is usually not considered severe. This persists to lesser degree for two or three hours and then disappears.

Following treatment with liquid nitrogen, redness and swelling develop within a few minutes. Blistering is delayed for several hours and reaches a peak on the second or third day. In treating lesions which are to be destroyed, the desired reaction is one in which a blister is produced in a narrow zone about and beneath the lesion, separating it from the normal surrounding tissue.

The patient should be told to return in 24 to 48 hours after treatment to see if satisfactory reaction has developed. If it has not, the lesion may be retreated at that time.

The author does not usually open and drain the blisters or remove the tops of them. Rather, the blister top is left in place. This makes the after-care simpler since secondary infection rarely occurs and dressings are not required. The blister dries and the top separates and exfoliates spontaneously within about three weeks. Patients are asked to return as soon as this has taken place. It is usually possible then to tell whether or not the lesion has been treated successfully. If a wart has not completely disappeared, it will be smaller, shallower and devoid of horny covering. A second treatment applied then is much more likely to complete the removal than if retreatment is delayed. In an occasional case the blister continues to spread beyond the area frozen. Apparently pressure of the vesical fluid causes this enlargement. It seems to occur most commonly in lesions localized over joints or pressure points. When this occurs the vesicle top should be removed promptly and a sterile dressing applied.

In treating conditions involving larger areas, such as contact dermatitis, scarring in acne vulgaris and patches of lichenified eczema, a somewhat different technique is usually used. A larger applicator is needed. Several of the smaller common 6-inch applicator sticks may be combined, or a sturdier stick can be made by wrapping cotton about the end of a suitable length of quarter-inch doweling. This larger applicator is then dipped into the liquid nitrogen and applied either in a slow rolling or sliding manner. In treating the conditions mentioned, the reaction desired is less intense, and severe blistering is usually avoided. Slowly sliding such an applicator over the skin with moderate pressure may suffice to produce sharp delayed erythema followed by exfoliation. Such mild reactions may be of some value in the treatment of alopecia areata.

The low temperature of the liquid nitrogen causes a rapid condensation of atmospheric moisture on the cotton applicator. Thus, if several lesions are being treated or if several patients are treated in rapid succession, the applicator may become coated with ice. This interferes with its saturation with the liquid nitrogen. Likewise ice collects slowly about the opening of the thermos jug and may float on top of the liquid nitrogen. When all the liquid gas has evaporated, the ice will thaw and collect in the bottom of the thermos as water. Such icing is minimized in the commercial containers made expressly for transportation and storage of these gases by the small size of the opening. The container should be emptied and dried before it is refilled.

Liquid nitrogen has been of greatest use in the treatment of warts of the common and juvenile plane types, and it is frequently used in the treatment of superficial keratoses, both seborrheic and senile types. Although with pressure and increased length of freezing, liquid nitrogen can be made to be quite destructive, the author does not use it where appreciable thickening or infiltration of the base of a keratosis is present. Electrodesiccation is preferred for such lesions. In the author's opinion, freezing with liquid nitrogen is the best method for the removal of permanent freckles commonly seen on the exposed skin in older people, if such removal is desired.

The use of liquid nitrogen in hemangiomas is best confined to the more superficial hypertrophic vascular nevi. Solid carbon dioxide is more often used for such lesions, especially if the tumor is elevated or thickened more than a few millimeters. Liquid nitrogen may be satisfactorily used in treating small senile angiomas and the lesions of nevus araneus. In the latter, electrolysis or a fine electrodesiccating spark may be preferable if the central punctum and individual radiating vessels stand out clearly.

Superficial leukoplakia may be satisfactorily treated with liquid nitrogen. If the lesion is in the oral cavity, the patient should be instructed to hold his breath, since the intense cold fogs the moist atmosphere and obscures vision. Keloids, particularly if small, may be improved by freezing with liquid nitrogen, and the lesions of folliculitis cheloidalis have been improved greatly by freezing. The margins of individual pitted scars may be smoothed by this treatment and diffuse pitted scar-

TABLE 1.—*Results of Treatment of Common Warts with Liquid Nitrogen*†

154 patients; follow-up period 4 to 15 months

	No. of Patients	Per Cent	No. of Warts	Per Cent
Cures	97	63	243*	57
One treatment	60	39	111*	26
Two treatments	24	16	58	14
Three treatments	13	8	74	17
Failures	40	26	110*	25
One treatment	18	12	43*	10
Two treatments	11	7	22	5
Three treatments	3	2	13	3
More than three treatments	8	5	32	7
Partial cures (some warts disappeared, others did not)	17	11	77*	18
Cures				
One treatment			36*	8
Two treatments			10	2
Three treatments			2	....
More than three treatments			....	....
Failures				
One treatment			17*	4
Two treatments			6	1
Three treatments			5	1
More than three treatments			1	....

† Cowell Memorial Hospital, Student Health Service, University of California.

* Number of warts not accurate; represents least number in each category; if all records were complete, totals would be greater.

ring such as follows acne vulgaris may be conveniently treated by less intense repeated freezings with liquid nitrogen.

Acute contact dermatitis such as that produced by exposure to poison oak or ivy has long been treated by freezing with liquid gases. At the Student Health Service clinic at the University of California, this method has been in use for at least 25 years. Although it is difficult to evaluate such treatment by comparison with untreated controls, it is the author's impression that it is of value particularly when applied early to small lesions. When the dermatitis is widespread, use of the method is not practical. Similarly, isolated lesions of stubbornly resistant lichenified eczema and hypertrophic lichen planus have been treated by this method, with perhaps some improvement and relief of itching.

In granuloma annulare and stubborn discoid lupus erythematosus, in which a sharp inflammatory reaction extending to some depth is desired but in which destruction of tissue is to be avoided, solid carbon dioxide may be preferable.

Pyogenic granulomas have been successfully treated with liquid nitrogen, but the results of electrodesiccation and curettage are more uniformly successful.

Liquid nitrogen is of sufficient value in the treatment of warts and keratoses alone to justify keeping it at hand. It is easily and relatively quickly applied and lends itself to use on patients with multiple lesions. The pain involved is not great. After-care is simple. No dressing is used unless the vesicle is broken. Complicating secondary infection is rare and residual scarring is minimal. With superficial lesions no appreciable scar is to be expected. In deeper lesions mild to moderate depigmentation and perhaps slight atrophy result. It produces less scarring than other methods. Atrophy and depigmentation are noticeable only when repeated intense freezing is used, as for example in deep, resistant periungual warts. None of a number of physicians who have used this for years in the clinic and in offices has ever seen a keloid result from its use, even when deep and intense reactions are produced.

In an attempt to evaluate the use of liquid nitrogen in the treatment of warts at the clinic at the University of California, Berkeley, 154 patients, all of whom had common warts, were followed for from four to fifteen months. The results are summarized in Table 1.

While these results leave much to be desired, they are sufficiently good to justify the use of this method at least in selected cases of warts until some more specific treatment becomes available.

In order to visualize what takes place when liquid nitrogen is applied to the skin, two areas of normal skin approximately 0.75 cm. in diameter on the abdomen of an adult white male were frozen with light pressure for 45 seconds. One of these was excised after 30 hours and the second after eight days. Under the microscope a section of the 30-hour specimen showed a vesicle which had raised the epidermis cleanly from the dermis at the dermo-epidermal junction. The dermis was edematous, especially in its upper portion, and showed slight basophilic degeneration. There was a mild infiltrate of inflammatory cells scattered throughout the dermis. The majority of the cells were polymorphonuclears, but some round cells were also present. The section of the eight-day specimen showed the degenerated remains of the old epidermis which constituted the roof of the vesicle. A newly regenerated epidermis, two or three or more cells thick, was already present. Edema and cellular infiltrate were less pronounced than in the 30-hour specimen.

3115 Webster Street.

REFERENCE

1. Kile, R. L., and Welch, A. L.: Liquid oxygen in dermatologic practice, Arch. of Derm. & Syphilology, 57:57, January 1948.

Ruptured Cervical Intervertebral Discs

C. Hunter Shelden, M.D., and Robert H. Pudenz, M.D., *Pasadena*

SUMMARY

Intractable pain in the neck and upper extremity is frequently radicular in character and mechanical in origin. Rupture of a cervical intervertebral disc is the most common cause.

Diagnosis and localization are more difficult in the cervical than in the lumbar region. Pantopaque myelogram should be considered only as a mean of localization. Operation should be preceded by a thorough trial of conservative treatment.

RUPTURED intervertebral discs in the cervical region present considerably different problems in diagnosis and surgical management than do similar lesions in the lumbar area. The factors which add to the complexity of the problem in the cervical region are largely anatomical in nature. The vertebral column in the cervical region contains not only the nerve roots but also the spinal cord. Consequently, the symptoms may result from involvement of the nerve root or of the spinal cord or of any combination of these two structures. Other factors are the greater mobility of the cervical spine and the more localized cutaneous representation of the individual nerve roots in the neck than in the lumbar region. Motor disability, when present, is more pronounced in view of the greater specialization of individual muscles in the upper extremity.

Another anatomical factor which increases the complexity of diagnosis in the upper extremity is the formation from the cervical nerve roots of the brachial plexus along the path of which are many important structures, such as the scalenus anticus muscle, the subclavian artery, the clavicle and the pectoralis major muscle, as well as the first rib. All of these structures are theoretically capable of producing irritation to the brachial plexus with clinical signs which may be difficult to distinguish from those of a radicular lesion.

SYMPTOMS

Theoretically, rupture of an intervertebral disc can occur at any level in the cervical spine. However, as in the lumbar region, there are certain sites of predilection. The most frequent sites of rupture are between the fifth and sixth and between the sixth and seventh cervical vertebrae. Since there are seven cervical vertebrae and eight cervical nerve roots, the root which takes exit between the fifth and sixth cervical vertebrae is the sixth cervical root. That between the sixth and seventh cervical vertebrae is designated as the seventh cervical root. Compression of either root produces a clinical picture which permits accurate neurological localization.

Mechanical lesions involving the nerve root produce motor and sensory findings of radicular character, in contradistinction to the motor and sensory findings produced by a lesion affecting a peripheral nerve.

Irritation of the sixth cervical root produces symptoms in the distribution of both the radial and median nerves corresponding to those fibers in the peripheral nerve which take their origin from this nerve root alone. When the sixth cervical root is irritated by mechanical pressure, the sensory findings are limited to numbness and paresthesias involving the thumb, first and second fingers. The pain accompanying such a lesion, however, may vary widely in distribution. It generally affects the area between the vertebral margin of the scapula and the vertebral column, the region over the anterior pectoralis major muscle, in the precordial region, as well as the neck, shoulder, upper arm and along the radial aspect of the forearm. The pain generally does not extend into the fingers. Weakness is usually confined to the triceps muscle.

When the seventh cervical root is irritated, the sensory findings of numbness and paresthesias involve chiefly the third and fourth fingers. The motor loss involves not only the triceps muscle but also the extensors of the wrist and fingers. The pain associated with seventh root compression is more often limited to the shoulder, arm and forearm.

The onset of symptoms varies greatly in individual patients. Frequently there is a history of recurrent attacks of stiffness of the neck associated with pain and muscle spasm, but no evidence of radiation into the arm or forearm. Months or even years later, the sudden onset of severe radicular pain involving the arm may be precipitated by some physical effort such as lifting, coughing or sneezing. Symptoms occur in attacks of short duration, usually followed by a period of more or less complete freedom. Attacks tend to become more frequent in occurrence with extension of pain into the neck, shoulder and, later, the arm and forearm. The attacks recur on the same side with symptoms appearing in identical areas with each attack. Frequently the patient complains only of pain and numbness, being unaware of the presence of any muscular weakness. During an acute attack, any muscular effort involving the neck or arm may be extremely painful. Likewise, in most

---

Presented before the Section on Industrial Medicine and Surgery at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

radicular lesions, coughing, sneezing or straining may aggravate the pain. Night pain, particularly between two and four o'clock in the morning, is common.

DIFFERENTIAL DIAGNOSIS

A ruptured intervertebral disc in the cervical region may present difficulty in diagnosis because of the greater number of important structures which must be considered as etiological factors. Lesions which must be considered in the differential diagnosis are cervical arthritis, scalenus anticus syndrome, cervical rib, old fracture of the clavicle and, if the pain is on the left side, coronary heart disease.

Symptoms produced by a ruptured intervertebral disc are often attributed to the presence of radiologically visible arthritis of the cervical spine. It is true that arthritis may produce radicular symptoms, but usually these are not confined to one upper extremity. A compression syndrome involving one nerve root should not be attributed to primary cervical arthritis without thorough neurological investigation.

The scalenus anticus syndrome is without doubt a clinical entity, but it does not exist anatomically nearly as often as it is diagnosed clinically. The primary feature of this syndrome is compression of the subclavian artery, with pain a secondary factor. Without objective evidence of vascular disturbance, the diagnosis should be made with caution. Obliteration of the radial pulse should be readily demonstrable and limited to the side of the clinical symptoms. Section of the scalenus anticus muscle for pain alone, particularly when limited to the radial aspect of the hand, seldom results in relief of symptoms.

The presence of a cervical rib on the side of the pain and paresthesias may make the differential diagnosis difficult. It is helpful to recall that the site of the mechanical irritation caused by a cervical rib involves the brachial plexus directly; hence the distribution of pain and paresthesias is more widespread than can result from compression of a single nerve root. If, after adequate investigation, doubt still exists concerning the essential lesion, it is better clinical judgment to resect the scalenus anticus muscle first, since this procedure is less formidable than cervical hemilaminectomy.

Poorly united fractures of the clavicle are liable to produce excess callus formation, particularly on the under surface. Such lesions have been observed to produce very localized areas of pain and paresthesia in the upper extremity. Old fractures of the first rib with callus formation likewise may produce a point of mechanical irritation to the brachial plexus. Wide resection of that portion of the clavicle or first rib results in complete relief of symptoms.

Suspected coronary heart disease may lead to confusion in diagnosis when the radicular symptoms are limited to the left side. This is particularly true when the sixth nerve root is involved, since pain may be limited to the anterior pectoral region on the left with radiation into the left upper arm. Patients having recurrent attacks of severe pain, without other features of angina and with repeatedly normal electrocardiograms, should be considered as having a ruptured intervertebral disc. The presence of muscular weakness in the triceps or extensors of the wrist and fingers should be of definite aid in establishing a correct diagnosis.

Lesions more nearly in the midline affect primarily the spinal cord and must be differentiated from spinal cord tumor, multiple sclerosis, primary lateral sclerosis and syringomyelia.

The most consistent diagnostic feature of spinal cord tumor, early in its course of development, is the presence of symptoms and signs gradual in onset and progressive in character. A history of trauma is usually lacking, as well as recurrent acute attacks of pain and muscle spasm in the neck. Night pain is a characteristic symptom of spinal cord tumor. Frequently pain awakens the patient from a sound sleep and is relieved if the patient gets out of bed and walks about the room. Pyramidal and spinothalamic tract signs may be present in either type of lesion, but the history of steady progression is seldom present with ruptured intervertebral disc.

Primary lateral sclerosis should offer little difficulty in diagnosis because the pyramidal tracts are the only portion of the spinal cord affected. Exaggerated deep tendon reflexes, increased muscle tone and positive Babinski signs without sensory impairment are diagnostic.

Multiple sclerosis is characterized by remissions and exacerbations of clinical signs and symptoms. The cardinal features of this syndrome are nystagmus, pronounced incoordination and pyramidal tract signs. The history of old retrobulbar neuritis, appearing even years before the onset of other symptoms, may afford a clue to the proper diagnosis.

Primary cavitation of the spinal cord should offer little difficulty in differential diagnosis because of the long history, the muscular atrophy, as well as the presence of a well-defined zone of disassociated anesthesia corresponding to the area of involvement of the spinal cord.

The diagnosis of ruptured intervertebral disc should be made by clinical means. No special laboratory procedures can take the place of careful history taking and neurological examination. Special diagnostic procedures such as x-rays, electromyogram, lumbar puncture and Pantopaque® myelography should be employed to eliminate the etiological possibilities and to localize the actual site of the lesion.

Roentgenograms of the cervical spine should be taken routinely. They should include three-quarter views of the spine and a projection through the mouth as well as the routine anteroposterior and lateral views. X-ray findings associated with ruptured intervertebral disc include the loss of the usual cervical curve, a point of localized narrowing of the intervertebral disc, and hypertrophic changes of the adjacent vertebrae. Frequently, these localized hypertrophic changes are considered as primary cervical arthritis, but in all probability they represent a secondary reaction of the adjacent vertebrae to an abnormal mechanical factor at the level of the ruptured intervertebral disc. In normal circumstances the intervertebral disc has a very high water content, and consequently any motions of the cervical spine produce a distribution of force which follows a hydrostatic principle. Secondary to degeneration of the intervertebral disc and subsequent rupture, there results a decrease in the water content of the disc. Motion of the cervical spine then produces a stress and strain on the adjacent vertebrae which follows a mechanical rather than a hydrostatic principle. In such circumstances, forward motion of the cervical spine results in far greater force being placed upon the anterior margin of the vertebrae, and over a period of time there result hypertrophic changes, particularly along the anterior margins of the adjacent vertebrae, which account for the localized changes so frequently seen in association with a rupture of one of the cervical intervertebral discs. It would seem most unlikely to find a far advanced arthritic process limited to two adjacent vertebral bodies without some evidence of involvement of the remaining cervical spine.

The electromyogram has recently proved to be of great value in the differential diagnosis, particularly of those lesions which affect the motor component of the nerve root. A careful electromyographic examination will reveal evidence of lower motor neuron disease as demonstrated by the presence of fasciculation in the individual muscles supplied by the motor component of the involved nerve root. This excellent adjunct to neurological diagnosis has not been fully investigated. However, the authors believe that the presence of positive electromyographic evidence affords a reliable means of localization.

The value of lumbar puncture and careful cerebrospinal fluid investigation cannot be overemphasized. The procedure is done with the patient in the horizontal position. The needle should be introduced carefully to prevent blood contaminating the spinal fluid. Determination of the initial pressure and the response to jugular compression are carried out as a routine procedure. A complete examination of the spinal fluid obtained should be done without delay. The most important spinal fluid examination in the diagnosis of ruptured intervertebral disc is the determination of the total protein. An elevation of the total protein generally signifies a lesion producing nerve root or direct spinal cord irritation.

Myelography has proven to be of great value, but it should be considered as a method for accurate localization of the lesion and not employed to replace clinical diagnostic procedures. The accepted medium used at present is Pantopaque. All too often myelography has been used as the first method of investigation rather than the last. Cervical myelography is a difficult procedure and should not be attempted by those unfamiliar with fluoroscopic technique.

TREATMENT

The proper care of individuals with intractable pain in the upper extremity requires careful clinical judgment. It must be remembered that not every pain in the shoulder and arm results from ruptured intervertebral disc. Other types of neuritis occur which are not of a mechanical nature. Careful clinical investigation should be made to exclude sites of focal infection. Referred pain from a ligamentous lesion adjacent to the spinal vertebral column may simulate a radicular syndrome. When not to operate is as important in this as in any other surgical problem. It would seem safe to state that no patient should be operated upon during the first attack of pain, no matter how severe, without first having conservative treatment. This should consist of heat, physical therapy and traction. Oftentimes even skeletal traction is necessary in order to obtain sufficient pull without discomfort to the patient. It is probable that over 90 per cent of individuals will obtain complete relief in the first or even subsequent attacks by such conservative procedures.

The indications for operation are failure to obtain benefit by conservative means, the appearance of pronounced increase in the positive objective neurological findings, or the development of spinal cord signs.

The actual surgical removal of the ruptured intervertebral disc is not difficult. It is purely a mechanical problem consisting of the location and removal of the offending fragment, which is generally located far laterally beneath the nerve root at the level of the involved intervertebral disc. Removal is best accomplished under general intratracheal anesthesia with the patient in a sitting position. Both the midline incision and partial hemilaminectomy should be adequate to allow proper exposure. Thus, removal of the fragment may be accomplished without damage to the nerve root or the adjacent spinal cord. The approach is extradural. The dura itself is not opened except in rare instances, because the presence of spinal fluid serves as a hydrostatic buffer which protects the spinal cord.

The lesion may appears as a bulging of the posterior longitudinal ligament or as a complete rupture through the ligament into the extradural space. Frequently an area of bony reaction is found about the margin of the herniated portion of the disc material, and it is generally advisable to remove the area of bony reaction as well as the cartilaginous material. After removal, the wound is closed in layers without drainage.

No special postoperative care is necessary, and patients are allowed out of bed on the first or second day.

Complete relief of symptoms can be anticipated if adequate care is exercised in the selection of patients for operation.

696 East Colorado Street.

Treatment of Miliary and Meningeal Tuberculosis in Infants and Children

THOMAS L. PERRY, M.D., *Los Angeles*

SUMMARY

Streptomycin and combined streptomycin-promizole treatment of miliary and meningeal tuberculosis in infants and children at the Los Angeles Children's Hospital has resulted in clear-cut arrests in seven patients, two of whom had meningitis. A much longer period of observation will be necessary before these patients may be considered cured. These results are incomparably better than the universally fatal outcome of both diseases in a large and unselected group of untreated cases which has been studied. Promizole, and possibly also para-aminosalicylic acid, should be given concurrently with streptomycin. As they are relatively harmless drugs, they should be given to ambulatory patients for a long period of time after arrest of the disease to decrease the likelihood of recurrence. If necessary, streptomycin may be given for longer than 90 days, or in second courses, since combined chemotherapy apparently delays the appearance of streptomycin-resistant strains of tubercle bacilli. The current pessimism with which many pediatricians view miliary and meningeal tuberculosis is unwarranted. Optimism will be rewarded with many more recoveries in the future.

MILIARY tuberculosis and tuberculous meningitis have for a long time been the most dread forms of a much-feared disease, and particularly for the pediatrician. The majority of deaths from tuberculosis among infants and children are as a result of disseminated miliary tuberculosis or of tuberculous involvement of the brain and meninges. Some 70 per cent of all cases and deaths from tuberculous meningitis occur in the pediatric age group.[13] Since the advent of the sulfonamides and penicillin, most acute infectious diseases of infants and children have become readily curable, thus spotlighting these two infections entailing so high a mortality rate.

Acute disseminated miliary tuberculosis is, without treatment, an almost universally fatal disease in children, although a few spontaneous recoveries have been reported. Occasionally a child is seen in whom roentgenograms demonstrate multiple miliary calcifications in the lungs, liver and spleen, presumably the result of a previous widespread hematogenous dissemination of tubercle bacilli, which the body has managed to heal without outside assistance. For all practical purposes true caseous tuberculous meningitis is universally fatal in the absence of specific chemotherapy. No spontaneous recovery from classical tuberculous meningitis has been reported. Thus, prior to the introduction of streptomycin, a pediatrician confronted with a child with miliary or meningeal tuberculosis could do little more than offer symptomatic care. Lincoln[8] has described a new syndrome, serous tuberculous meningitis, to be discussed later in this presentation, from which spontaneous recoveries have been reported.

STREPTOMYCIN

Streptomycin has considerably changed the picture in the treatment of tuberculosis, and for the two forms of the disease under discussion it has proved a bright ray of hope. A number of arrests of miliary tuberculosis in all age groups have been reported, and there are a few well documented apparent recoveries from tuberculous meningitis. Many clinicians have observed pronounced improvement in children and adults with tuberculous meningitis treated with streptomycin, only to have their hopes dashed when the disease recurred a few months after health apparently had been regained and the treatment stopped. One of the best studies of a large group of streptomycin-treated patients is that of Bunn,[2] who reported on the first 100 consecutive cases of miliary and meningeal tuberculosis in adults treated in 52 Veterans Administration hospitals during 1946 and early 1947. These patients were all given streptomycin in large dosage, both intramuscularly and intrathecally, for an average of 120 days each. They were followed up to June 1948, or from 13 to 26 months from the beginning of treatment. Of 22 patients having miliary tuberculosis alone, nine had died and 13 were living. Of 43 patients who had tuberculous meningitis alone, 34 had died and nine were alive. And of 35 patients who had both miliary tuberculosis and tuberculous meningitis, 33 had died and only two remained alive. Thus at the end of one to two years, only 24 per cent of all the patients

---

From the Department of Pediatrics, University of Southern California School of Medicine, and the Children's Hospital.

Presented before the Section on Pediatrics at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

were alive, and of those having meningitis only 14 per cent were alive. In a series of 105 cases of tuberculous meningitis studied by the Medical Research Council in hospitals in England and Scotland,[11] at the end of a minimum of four months' observation, only 12 per cent of a group of 33 patients under the age of three were alive and doing well, while 36 per cent of a group of 72 children and adults over the age of three were making good progress.

There are apparently two good reasons why the initial dramatic improvement observed in many patients with miliary and meningeal tuberculosis who are treated with streptomycin is not maintained. The first is the development of streptomycin resistance by the infecting tubercle bacilli after a variable period of treatment. Several groups of investigators[1, 4, 15] have observed in adult pulmonary tuberculosis, where tubercle bacilli may be readily recovered at intervals during streptomycin therapy, that at the end of three months of treatment 40 to 50 per cent of the strains recovered showed significant streptomycin resistance, and at the end of four months of treatment 70 to 80 per cent of the strains recovered have become resistant to the drug. The second reason for relapse after initial favorable response to streptomycin, especially in the case of tuberculous meningitis, is the persistence of a caseous tuberculous focus which does not heal and in which viable tubercle bacilli remain beyond the reach of streptomycin and ever ready to break out anew into the blood stream or the subarachnoid space. Rich and McCordock[12] in 1933 demonstrated pathologically that tuberculous meningitis is not due to a direct hematogenous seeding of the meninges, but to a preexistent caseous focus, usually a tuberculoma, which discharges tubercle bacilli directly into the subarachnoid space.

In the last two years, particularly since it has been demonstrated that streptomycin is not the final answer in the treatment of tuberculosis, various new efforts have been made in the treatment of miliary and meningeal tuberculosis. Lincoln[9, 10] at Bellevue Hospital has introduced the use of promizole, one of the sulfone compounds which has some tuberculostatic activity. She was able to achieve arrests in three cases of miliary tuberculosis using promizole alone, and to gain encouraging preliminary results in tuberculous meningitis in children, using a combination of streptomycin and promizole. In Italy the combination of streptomycin and sulfone is being used.[3, 5] At the Mayo Clinic[6] a combination of streptomycin, promin and para-aminosalicylic acid (PAS) is being used in the treatment of certain cases of pulmonary tuberculosis. PAS has a strong in vitro bacteriostatic action against virulent tubercle bacilli, and has been shown to exert a beneficial effect on experimental tuberculosis.[16] Finally, Waksman,[14] the discoverer of streptomycin, has recently described a new antibiotic, neomycin, which has pronounced antituberculous action and which, although not yet available for clinical use, offers considerable hope for the future.

NATURAL HISTORY OF UNTREATED DISEASE

Experience with miliary tuberculosis and tuberculous meningitis at the Los Angeles Children's Hospital bears out many of the conclusions briefly described in preceding paragraphs, but the experience in the last two years has been sufficiently encouraging to be worth reporting. A review of data on the two diseases before the advent of specific chemotherapy provides a useful basis for comparison against results obtained with chemotherapy. During the 15 years 1934 to 1948 inclusive, 146 patients with miliary and meningeal tuberculosis were admitted to the hospital and given only symptomatic treatment. Twenty-one patients had miliary tuberculosis, 58 had tuberculous meningitis, and 84 had both diseases. Of the 146 patients, all died of the disease. For the group the average duration of life from the onset of symptoms was 20 days for those with meningitis, and 40 days for those having miliary tuberculosis alone.

PATHOLOGY

Autopsies were done on 80 infants and children who died of tuberculous meningitis. In 27 of these patients (34 per cent) one or more tuberculomata were demonstrable in the brain, these caseous foci being pathologically older than the tuberculous involvement of the leptomeninges. In some cases the brain was not sectioned, and in others no careful search for caseous foci was made, so that it is probable that actually more than 34 per cent of these patients had tuberculomata antedating meningitis. A second significant finding was that in 17 of the 80 autopsied patients with meningitis, there was no evidence of miliary tuberculosis elsewhere in the body. Other patients with advanced tuberculous meningitis pathologically, showed only a minimal, early hematogenous seeding in the lungs, liver and spleen, suggesting that the miliary spread as well as the meningitis derived from the older caseous intracranial focus. These data support the theory of Rich and McCordock[12] that tuberculous meningitis is the result not of a direct seeding of the meninges from the blood stream, but of actual rupture of an expanding intracranial caseous focus into the subarachnoid space, or of migration of tubercle bacilli to the meninges from an activated intracerebral tuberculoma via the Virchow-Robin lymph spaces.

UNSUCCESSFULLY TREATED PATIENTS

Since 1946, 22 infants and children with bacteriologically proven miliary and meningeal tuberculosis have been treated with streptomycin at Los Angeles Children's Hospital. Twelve of these patients were given promizole in addition. In five of the 22 cases, treatment was not started until the disease was in a terminal stage. All of these five patients died promptly, but each was moribund on admission, and each received less than seven days of treatment.

Six additional patients were treated unsuccessfully. Of these, two who had both miliary and meningeal tuberculosis died after one and two months, respectively, of streptomycin treatment. Two patients died during the first recurrences of tuberculous meningitis, occurring five and ten months, respectively, after original attacks which responded favorably to streptomycin. One of these patients was given promizole in addition to streptomycin. A fifth unsuccessfully treated patient died of far-advanced caseating pulmonary tuberculosis, seven months after successful arrest of miliary and meningeal tuberculosis by combined streptomycin-promizole therapy. The remaining unsuccessfully treated patient is still alive, but seems destined to die. He is currently in the second recurrence, or third attack, of meningitis. In the first two attacks streptomycin alone was given and the meningitis cleared completely. In the present attack, both streptomycin and promizole are being given, but no significant improvement has been noted.

SUCCESSFULLY TREATED PATIENTS

Seven infants and children were successfully treated, five of them with streptomycin alone, and two with the addition of promizole. Five of these patients had miliary tuberculosis without meningitis. Each is now in good health. They have been observed respectively, 32, 28, 25, 12, and seven months since the onset of miliary tuberculosis. Two infants and children who had combined miliary and meningeal tuberculosis have had arrest of the disease. One of the two was given streptomycin, and one combined streptomycin and promizole. Both are living, mentally normal, and free of meningeal involvement 24 and seven months, respectively, since the beginning of treatment. One is in good health, and one still has tuberculous osteomyelitis in the right foot which existed before the meningitis. In addition to the seven patients classed as successfully treated, four children with meningitis are currently being treated in the hospital, and although the period of observation has been short, two seem to have a good chance of recovering.

PLAN OF TREATMENT

The plan of treatment followed in 1946 and 1947 consisted in an average streptomycin dosage of 1 gm. daily, given in three-hourly intramuscular injections, for an average period of 90 days. Those patients with meningitis were also given intrathecal streptomycin, 50 to 100 mg. daily or every other day for the first one to two months of treatment. More recently the plan of treatment has consisted in intramuscular streptomycin given only once every 12 to 24 hours, in a total daily dosage of from 0.25 to 0.50 gm., for a period of 90 days. Twelve patients with meningitis have been given intrathecal streptomycin in addition, in a dosage of 10 to 20 mg. every two to four days; and four patients with meningitis have been given no intrathecal streptomycin. One of the two patients who were successfully treated for tuberculous meningitis received no intrathecal streptomycin. Promizole has been given orally in a total daily dosage varying from 1 to 8 gm., depending on body weight, with the dosage gradually increased until a serum promizole level of 2 to 3 mg. per 100 cc. is obtained. The plan calls for continued administration of promizole for a period of two years following discontinuance of streptomycin.

TOXICITY

The toxic effects of treatment in the seven successfully treated patients, and in the four unsuccessfully treated patients who survived for some months, have been chiefly the loss of vestibular function produced by streptomycin. The earlier patients, who received 1 gm. daily for 90 days, all developed persistent loss of vestibular function as demonstrated by the caloric test, but this has been well compensated, and the children walk well now and show no disturbance of balance. Two successfully treated recent patients, given 0.5 and 0.25 gm. daily, have not had disturbance of vestibular function. One child who was treated in another hospital for the first two attacks of tuberculous meningitis and who was given large amounts of streptomycin both intramuscularly and intrathecally for a total of 140 days, now has severe ataxia and is unable to stand. A second child, who received large doses of streptomycin intrathecally for one month at another hospital, became both blind and deaf six months before death; it is difficult to say whether these effects should be ascribed to streptomycin or to severe meningitis. A third infant who was given 1 gm. of streptomycin intramuscularly daily for three months, as well as 50 mg. intrathecally daily for five weeks, became completely deaf after arrest of tuberculous meningitis. In those patients given streptomycin intrathecally it was noticed that anorexia and vomiting were often increased; and in one patient who was given streptomycin intrathecally, signs of temporary transverse myelitis repeatedly appeared near the site of administration soon after injection.

There is considerable disagreement as to the advisability of using streptomycin intrathecally in the treatment of tuberculous meningitis, since it is known that the drug does appear in the spinal fluid after intramuscular injection, and in larger amounts where pathological inflammation of the meninges exists. Levinson[7] has recently reported eight successful arrests of tuberculous meningitis among 19 children treated without intrathecal use of streptomycin. On the other hand, the British clinicians coordinated by the Medical Research Council[11] found a significantly higher number of patients made good progress when the drug was given intrathecally. In experience so far at the Los Angeles Children's Hospital, good arrest of caseous tuberculous meningitis was obtained in one case in which the drug was not given intrathecally, and there was evidence of increased toxic reaction when the intrathecal route was used.

No significant toxic effects of promizole have been noted thus far in patients at Children's Hospital. Some patients had considerable vomiting while receiving promizole, but this is also a common symptom of tuberculous meningitis. Pronounced erythematous rash developed in one child, but it later disappeared without discontinuance of promizole. All patients frequently passed red urine. The red color was found to be due to the presence in the urine of a metabolic breakdown product of promizole of unknown structure. The chronic toxic effects of promizole administration described by Lincoln,[9] namely thyroid enlargement with reduction in colloid, and breast hypertrophy in females, have not been observed at Children's Hospital, perhaps because at the time of this report none of the patients had received promizole for longer than seven months. Serum iodine determinations on several patients after three to four months of promizole therapy have all been within normal range.

STREPTOMYCIN SENSITIVITY OF TUBERCLE BACILLI

Attempts have been made to study the streptomycin sensitivity of tubercle bacilli isolated from the more recently treated patients. In every case the organisms isolated at the beginning of therapy proved highly sensitive to streptomycin, growth in vitro having been suppressed by 0.5 micrograms of streptomycin per cubic centimeter of culture medium. In only two cases has it proved possible to isolate strains from patients after long periods of treatment. Strains isolated from the spinal fluid of one child after 143, 187, and 212 days of streptomycin therapy were, surprisingly, still sensitive in vitro to 0.5 micrograms per cubic centimeter. Tubercle bacilli isolated from the spinal fluid of a second child after 101 days of streptomycin treatment were also sensitive to 0.5 micrograms per cubic centimeter. This failure of tubercle bacilli to develop the expected resistance to streptomycin after long periods of treatment is particularly interesting in view of the recent finding by Hinshaw and his coworkers[6] that in patients treated for pulmonary tuberculosis with a combination of streptomycin, promin and PAS, the tubercle bacilli developed resistance to streptomycin very slowly. Thus these adjuvant tuberculostatic drugs not only add to the beneficial effect of streptomycin, but appear to prevent the overgrowth of naturally occurring or mutant streptomycin-resistant organisms.

REASONS FOR THERAPEUTIC FAILURE

Little has been learned so far in the present series as to the reasons for therapeutic failure in those patients in whom treatment was started before the terminal stage of the disease. At autopsy of one child who died after one month's intrathecal and intramuscular streptomycin treatment four small tuberculomata in the brain were noted; one of them opened directly into the subarachnoid space and might therefore have caused a particularly heavy infection of the meninges. At autopsy of an infant who died of recurrence of tuberculous meningitis six months after return to good health following intramuscular and intrathecal streptomycin treatment of miliary tuberculosis with meningitis, multiple tuberculomata were noted in the substance of the brain. These lesions had blocked the aqueduct and had led to hydrocephalus. A third infant in whom miliary and meningeal tuberculosis were successfully arrested by combined streptomycin and promizole treatment, eventually died of extensive cavitating tuberculosis of one lung. However, it is suspected that in certain cases of both miliary and meningeal tuberculosis, even the best of therapy is foredoomed simply because tuberculous lesions of such extent that they cannot conceivably be healed already exist in the brain or elsewhere in the body.

SEROUS TUBERCULOUS MENINGITIS

It should be added that one of the two patients in whom meningitis has been successfully arrested probably had a syndrome termed by Lincoln[8] "serous tuberculous meningitis." This relatively benign form of the disease is thought to be due to meningeal irritation secondary to perifocal reaction around a lesion in the brain associated with an extension of tuberculosis elsewhere in the body. The signs and symptoms of serous and of true caseous tuberculous meningitis are the same. Features that distinguish the former from the latter are (1) absence of chemical changes in the spinal fluid, (2) failure (usually) to recover tubercle bacilli from the spinal fluid, and (3) the fact that patients with serous meningitis may recover without specific chemotherapy. In the one case of serous tuberculous meningitis in the present series, pronounced pleocytosis in the spinal fluid developed during the course of intramuscular streptomycin treatment of miliary tuberculosis, but there were no signs or symptoms of meningitis. The spinal fluid protein, sugar and chloride levels remained normal, and tubercle bacilli did not grow on cultures of the spinal fluid.

REFERENCES

1. Bernstein, S., D'Esopo, N. D., and Steenken, W., Jr.: Streptomycin resistant tubercle bacilli: incidence in patients treated with streptomycin, Am. Rev. Tuberc., 58:344, Sept. 1948.

2. Bunn, P. A.: One hundred cases of miliary and meningeal tuberculosis treated with streptomycin, Am. J. Med. Sci., 216:286, Sept. 1948.

3. Cocchi, C., and Pasquinucci, G.: Primi risultati ottenuti nella terapia della tubercolosi miliare ed in alcune forme di tubercolosi pulmonare con streptomicina associata a solfone ed a vitamin A, Riv. Clin. Pediat., 45:193, April 1947.

4. Council on Pharmacy and Chemistry, report on Streptomycin in the treatment of tuberculosis, J.A.M.A., 138:584, Oct. 23, 1948.

5. Frontali, G.: Miliary and meningeal tuberculosis treated with streptomycin. A study of 85 cases, Annales Paediatrici, 171:286. Nov.-Dec. 1948 (as abstracted in Internat. Med. Digest, 54:166, March 1949.

6. Karlson, A. G., Pfuetze, K. H., Carr, D. T., Feldman, W. H., and Hinshaw, H. C.: The effect of combined therapy with streptomycin, para-aminosalicylic acid and promin on the emergence of streptomycin-resistant strains of tubercle bacilli: a preliminary report, Proc. Staff Meet. Mayo Clin., 24:85, Feb. 16, 1949.

7. Levinson, A.: Treatment of tuberculous meningitis with streptomycin, Proc. Inst. Med. Chicago, 17:191, Nov. 1948.

8. Lincoln, E. M.: Tuberculous meningitis in children: Part II. Serous tuberculous meningitis, Am. Rev. Tuberc., 56:95, August 1947.

9. Lincoln, E. M., Stone, S., and Hoffman, O. R.: The treatment of miliary tuberculosis with promizole, Bull. Johns Hopkins Hosp., 82:56, Jan. 1948.

10. Lincoln, E. M., Kirmse, T. W., and De Vito, E.: Tuberculous meningitis in children. A preliminary report of its treatment with streptomycin and promizole, J.A.M.A., 136:593, Feb. 28, 1948.

11. Medical Research Council, Streptomycin in Tuberculosis Trials Committee: Streptomycin treatment of tuberculous meningitis, Lancet, 1:582, April 17, 1948.

12. Rich, A. R., and McCordock, H. A.: The pathogenesis of tuberculous meningitis, Bull. Johns Hopkins Hosp., 52:5, Jan. 1933.

13. Schwartz, J.: Tuberculous meningitis, Am. Rev. Tuberc., 57:63, Jan. 1948.

14. Waksman, S. A., and Lechevalier, H. A.: Neomycin, a new antibiotic active against streptomycin-resistant bacteria, including tuberculosis organisms, Science, 109:305, March 25, 1949.

15. Wolinsky, E., Reginster, A., and Steenken, W., Jr.: Drug-resistant tubercle bacilli in patients under treatment with streptomycin, Am. Rev. Tuberc., 58:335, Sept. 1948.

16. Youmans, G. P., Raleigh, G. W., and Youmans, A. S.: The tuberculostatic action of para-aminosalicylic acid, J. Bact., 54:409, Oct. 1947.

The Neurological Program of the Veterans Administration

WALTER F. SCHALLER, M.D., *San Francisco*

SUMMARY

The reorganization of the medical department of the Veterans Administration has given considerable impetus to neurology, a part of the division of psychiatry and neurology. The neurologic service of the V. A. is the largest in the world today, and is constantly increasing. This service is made available to veterans through hospitals and regional offices within the designated area, which are branch administrative offices under the central office.

A residency training program for specialization is under the direction of a deans' committee in every large medical center. This committee, which is formed from the faculties of medical schools, also approves the visiting medical staffs of hospitals. The neurologic program consists of a number of special activities, which include residency training for certification, neurologic diagnosis, rehabilitation of patients with chronic illness, electroencephalography, epilepsy, aphasia and research. The paraplegia program is now a separate service, but is also participated in by the neurologist. Both the neurologist and the psychiatrist are interested in the patient with organic psychosis, and the neurologist also works in close relationship with the neurosurgeon.

There is need for neurologists in the V. A., which offers attractive opportunities in clinical practice and in research, as well as inducements of advancement and adequate financial returns.

PRIOR to the adoption of the present medical program of the Veterans Administration the specialty of neurology in the United States was at a distressingly low ebb, save in several well established and recognized neurological centers. This alarming situation has recently been discussed in a number of papers. The author, in the presidential address before the American Neurological Association in 1946, stressed the importance of the basic neurological sciences to medicine, and to psychiatry in particular; in the same year addresses followed by Percival Bailey, and by George Wilson and Charles Rupp. The reactivation of neurology was made an important issue by Henry Riley in his presidential address before the American Neurological Association in 1947, and also by George Wilson as president in 1948.

It is here pertinent to discuss the reasons for this situation. Neurologists have always felt secure in what they believed to be an uncontested recognition of the importance of the most highly organized system of the human body, the nervous system, to those specialties identified with this system. Therapy has frequently been neglected by the neurologist, who has favored diagnosis and research. Quite the opposite situation prevails in the case of the neurosurgeon, who stresses treatment, and for this reason, neurologic cases are often directly referred to the neurosurgeon, by-passing the neurologist. Neurologists have not participated in movements of national interest, some of which are essentially of neurological nature—poliomyelitis, for example. They have not availed themselves of opportunities to obtain federal and other research grants by representation on important committees. Conservatism often connotes lack of aggression. Neurological services and cases are frequently taken over by internists, who are fearful of partitioning of their own specialty. Economic considerations facing the student aspiring to neurological specialization are often deterrent in the selection of this specialty. Today, most neurologists include psychiatry in their practice.

Important as are the foregoing factors in the dilemma of the neurologist, no single factor, in the author's opinion, is as important as the lack of support by many medical schools; and according to a recent survey this is especially so in the western United States. Such lack of support is evidenced by the absence of a properly organized neurological service, despite the proportionate representation of neurology in curricular hours as compared with other specialties, and the professorial rank of teachers. Approval of a residency training program in neurology has consequently been delayed by the Council on Medical Education and Hospitals of the American Medical Association. In 1948, only two residents in neurology were provided for in approved civilian hospitals in California. The attitude of the medical schools is reflected in the attitude of the medical profession in general, and is not to be wondered at, when recently one of the younger physicians asked me in all sincerity, "Is there any longer such a specialty as medical neurology?"

In 1946 the reorganization of the medical department of the Veterans Administration began to assume definite shape under Generals Omar N. Bradley, Administrator of Veterans Affairs, and Paul R. Hawley, chief medical director. Guided by the best interests of the disabled veteran, two changes were made: One, decentralization; the other, the formation of deans' committees.

For facility of administration, 13 subdivisions,

Area Consultant in Neurology, Department of Medicine and Surgery, Veterans Administration.

Presented before the Section on Neuropsychiatry at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

known as branch offices, were formed, each provided with a deputy administrator and a medical director. A recent major administrative reorganization abolished the branch offices and, for the purpose of medical supervision, has established five area offices as extensions of central office. Headquarters for these five area offices are located in San Francisco; Fort Snelling, Minnesota; St. Louis, Missouri; Atlanta, Georgia; and Boston, Mass.

Central Office: The central office is located in Washington, D. C. Dr. Paul B. Magnuson is the departmental head of medicine and surgery. The medical specialties are represented by divisions, such as the division of psychiatry and neurology, the division of medicine, the division of surgery, and others. Subdivisions of these specialties are known as sections. Dr. Harvey J. Tompkins is head of the division of psychiatry and neurology, and Dr. Pearce Bailey is head of the section of neurology. An over-all advisory committee assists Dr. Tompkins in professional and administrative problems. The chief medical director has several assistant medical directors, one of whom is Dr. E. H. Cushing, assistant medical director for research and education.

Area Offices: The San Francisco area office serves as a center for the supervision of the medical activities of Veterans Administration installations located in the states of California, Oregon, Washington, Idaho, Utah, Nevada and Arizona, and the territories of Hawaii and Alaska. The San Francisco area office is staffed with one full-time neuropsychiatrist, Dr. Lyle L. Woodfin, whose position title is chief of neuropsychiatry section. He supervises the psychiatric and neurological activities of the area. Area consultants in both psychiatry and neurology, appointed from the central office, contribute to the program by assisting in the selection of medical personnel, by offering advisory consultation, and by serving on special committees named by the chief medical director in the central office. Dr. Karl M. Bowman is area consultant in psychiatry, and is also a member of the San Francisco deans' committee and the subcommittee for neuropsychiatry. Veterans Administration neuropsychiatric activities reach the veteran through regional offices and hospitals.

Regional Offices: Regional offices are located in large centers of population in each area. Here the veterans are examined for pension and compensation purposes and receive treatment on an outpatient basis. Hospitalization is available either in neuropsychiatric hospitals or in neuropsychiatric services in general medical and surgical hospitals.

Deans' Committees: Members of medical school faculties constitute the deans' committees. They are empowered to formulate the educational and training programs in Veterans Administration hospitals under their auspices, to recruit specialists, and to appoint attending and consulting physicians to the various services. Residency and staff appointments are subject to their approval. In this way the Veterans Administration hospitals in the deans' committee program become identified with medical school methods of education and research, and hold to similar standards. Hospitals in remote areas are not now included, but ultimately may be. In these "non-teaching hospitals" a program of instruction has been set up, in which area consultants participate.

This seemingly involved scheme of organization operates quite smoothly in actual practice, considering the large number of invalided veterans and associated personnel. Approximately 60 per cent of all patients in veterans' hospitals fall into the neuropsychiatric classification, and a third of these are neurological. The neurological service of the Veterans Administration is the largest in the world today. Moreover, the patient load is constantly increasing. As an example, the peak patient load of World War I is only expected this year (1949). The number of epileptic patients in the next ten years is expected to reach 50,000. At present there are about 15,000 traumatic epileptics of record.

Relationship of Neurology to Psychiatry, Neurosurgery: In the Veterans Administration neurology is concerned largely with the patient with an organic lesion of the nervous system, whereas the psychiatrist is responsible for the diagnosis and treatment of the patient with psychoneurosis or functional psychosis. Both are interested in the patient with organic psychosis and both contribute freely in any case in which a combination of the talents of psychiatrist and neurologist are needed. At the hospital level psychiatry and neurology are represented by a chief of service qualified in both neurology and psychiatry and preferably certified in each. Other neuropsychiatrists may function under the supervision of the chief of service, depending upon the size of the service. Neurosurgery is a section under the surgical service. There is a close association between neurology and neurosurgery. A neurological and neurosurgical unit has been planned for the Veterans Administration neuropsychiatric hospital at Los Angeles. The accepted procedure is for neurosurgery to clear through medical neurology, save in emergencies or by special arrangement. Dr. Glen Spurling is the head of the national neurosurgical program and this service is represented in the San Francisco area by Dr. David L. Reeves.

The Veterans Administration programs in neurology consist of a number of special activities, which operate for the most part in large diagnostic and treatment centers.

The Residency Training Program: As of April 1949, there were 14 residency training programs in neurology in operation. Two of these are in California, one at the Veterans Hospital at Van Nuys, the other at Fort Miley, San Francisco. Approved residents are assigned to duty on neurological wards, they attend medical school courses, and by rotation in other services are grounded in the different neurological disciplines. Veterans are given credit for neurological experience gained in the last war; non-veteran residents are recruited from recent medical school graduates. Applications are processed through the chief of service in a training center hospital, to be eventually reviewed by the deans' committee. After the formal requirements of education demanded by certification boards have been fulfilled, the additional requirement of practice for certification may be met wholly or in part by becoming a staff member of a Veterans Administration hospital. There were 49 neurological residents in Veterans Administration hospitals as of February 1949. Ample financial assistance is given the resident qualified for residency training.

The Rehabilitation Program: Retraining and activation of persons suffering from chronic nervous disorders has been particularly studied at the Veterans Administration Hospital, Minneapolis, and results there have been so successful that a training center has been established at that station. In this area a sub-training center has been set up in the Veterans Administration Hospital at Oakland. The psychiatrist, the physical therapist, the psychologist, and the social service worker participate in teamwork with the neurologist to form a well-rounded program. Many helpless, bedridden veterans have been improved to the extent that they have been able to help themselves, leave the hospital, and return to their homes.

The Electroencephalography Program: The national EEG program is under the direction of Dr. Frederic A. Gibbs, who gives regular courses of instruction at the University of Illinois School of Medicine, Chicago. Any neurologist connected with the Veterans Administration neurological program may make application to attend this course. There is a repository of EEG records at the Hines Veterans Administration Hospital, Chicago, for future reference and research.

The Epilepsy Program: Dr. William G. Lennox of Boston directs the national program of the study of epilepsy. The headquarters of this activity is the Cushing Veterans Hospital at Framingham, Massachusetts. This is a center for all activities concerned with the care and study of the epileptic patient. Dr. Earl Walker of Baltimore heads the traumatic epilepsy program.

The Aphasic Program: This national program is headed by Dr. J. M. Nielsen of Los Angeles. His speech clinic is located at the Birmingham Veterans Administration Hospital at Van Nuys. This program has achieved recognition from the laity as well as the medical profession. Other aphasic centers are located at Framingham and at Minneapolis.

The Research Program: The Veterans Administration neurologist is eligible for federal research grants. Applications are made though Veterans Administration hospital clinics or medical schools associated with deans' committees. Approved projects are then reviewed by a subcommittee of the National Research Council, which reports back to the Veterans Administration and renders an opinion as to the value of the proposed research from the professional standpoint. The research in epilepsy was one of the first established. There are approximately five others under way.

The Paraplegic Program: This program was set up originally under the neurosurgery section of the surgical service but was later made a service within itself. Neurologists, urologists and other specialists participate in this program. There is a large service at the Birmingham Veterans Administration Hospital, Van Nuys, where the number of patients is constantly over 200. Dr. Ernest Bors, a urologist, conducts this service.

There is great need for trained neurologists, especially those qualified to head services, in Veterans Administration hospitals. The central office is constantly requested to provide neurologists, and must often reply that none is available. This shortage applies likewise to attending and consulting neurologists and has been a hindrance to the progress of the neurological program. The medical profession is, however, becoming aware of the exceptional opportunities for education, practice, and research in neurology through the Veterans Administration, and an encouraging interest is shown in inquiries and applications. The opportunity for a follow-up study in neurological cases is unparalleled. Compensation is comparable to that prevailing in other similar federal services and to that in the better-compensated medical school appointments. Grades commence with junior rating and run successively through associate, full, intermediate, and senior to chief, which is the highest rating either in the central or the area office. Advancement is limited only by limitation of ability. Compensation increases with length of service. Those certified in specialties are given 25 per cent over base pay. Pension and retirement provisions are similar to those enjoyed by comparable government services.

The value and need of neurologists in the Veterans Administration have proven an active stimulus to neurology in general and have called attention to the necessity of both setting up acceptable standards for teaching neurology in medical schools and disseminating information as to the true meaning of neurology as related to other specialties. Activities along such lines have been shown by the recent creation of the American Academy of Neurology, now with a membership of over 700, and appointments of public relations committees of the two national neurological societies. It is the earnest wish of those interested in neurology, representing the basic neurological sciences, to aid in every way the related specialties with which this branch of medicine comes into daily contact. This applies particularly to psychiatry.

In closing, a quotation of a great physician and organizer, General Paul R. Hawley, former head of the medical department of the Veterans Administration, may not be amiss. It is taken from an address before the Philadelphia Neurological Society, delivered on October 24, 1947. General Hawley said, "Regardless of any trends, it appears indisputable that the future of psychiatry will depend in large degree upon discoveries emanating from neuropathology and neurophysiology."

909 Hyde Street.

Coccidioidomycosis of the Meninges

William C. Buss, M.D., Thomas E. Gibson, M.D., and
Myrnie A. Gifford, M.D., *Bakersfield*

SUMMARY

In a review of 53 cases of coccidioidal disease, 50 of which resulted in death, some symptoms were noted to be so common as to facilitate diagnosis. Laboratory studies of spinal fluid gave helpful information. Particularly noteworthy with regard to roentgenologic studies was the fact that in no case in which there was pulmonary cavity formation due to coccidioidomycosis did coccidioidal meningitis develop.

In the last approximately 50 years coccidioidomycosis due to coccidioides immitis has been an important public health and medical problem in Central California, particularly in the southern end of the San Joaquin Valley.

In any discussion of coccidioidal granuloma, coccidioidomycosis of the meninges is an important phase.

Smith[2] and co-workers in a review of the literature stated that this mycotic infection has been noted to be endemic in western Texas along the Mexican border, in southern New Mexico, in southern and central Arizona, in southwest Utah and in the southern tip of Nevada. In California the disease is endemic in the southern San Joaquin Valley with irregular distribution up as far north as Modesto, Merced and Tracy, and in eastern Ventura and Santa Barbara counties. In southern California some cases have been reported in San Bernardino, Riverside and San Diego counties.

Because there is so much traveling by the general public, physicians will be on the alert for this disease not only in western United States, but also in other areas of the country.

Now that coccidioidal granuloma has been added to the list of reportable diseases, it is to be expected that a continual study of this disease will have additional significance to health officers in California.

All of the areas in which coccidioidomycosis is endemic are arid or semi-arid. The common finding is that the onset of the majority of the cases of coccidioidal meningitis within the boundaries of Kern County has been in the period May through November. However, the severity and frequency of dust storms occurring even in the so-called wet season implies that coccidioidal granuloma, with or without meningitis as a complication, may occur at any time during the year.

Physicians working in the Kern County Hospital and Health Department have estimated unofficially that some 67 cases diagnosed as coccidioidomycosis of the meninges have occurred in Kern County in the 13 years since 1936. Since reporting has not been complete and errors have occurred in the differential diagnosis of coccidioidomycosis of the meninges in this group of cases, this presentation will consider 53 selected cases. The diagnosis in each instance was confirmed by clinical, laboratory, biopsy and, in many instances, autopsy evidence.

Of the first 147 known and reported cases of coccidioidal granuloma that occurred in Kern County from 1901 to 1936, 67 were fatal. Of the 67 patients who died, only nine were stated to have had coccidioidal meningitis. It is interesting to note that three of the first four Kern County patients reported to have died of the disease were reported to have had coccidioidal meningitis.*

In a study by Kirshbaum† of 53 fatal cases of coccidioidal granuloma in Kern County, it was noted that 29 of the 53 patients also had coccidioidomycosis of the meninges. Kirshbaum felt that the lymphatic system acts as a barrier preventing dissemination to the meninges; upon a hematogenesis basis, fatal meningitis might have developed in even a greater proportion of cases.

Generally the incidence of coccidioidomycosis of the meninges is about twice as great in males as it is in females. In the age group 20 to 40 years there is even greater disparity; in this age span almost thrice as many men as women are affected. There is also a relatively higher incidence in Indians, Filipinos, Negroes, and Chinese than in white persons. Although the non-white group constitutes only about 8 per cent of the population in Kern County, almost 50 per cent of the total cases of coccidioidal meningitis have occurred among them.

Gifford,[1] in a study of coccidioidomycosis in Kern County which she reported in 1939, noted not only this disparity in incidence with regard to race and sex, but also that the death rate was considerably greater among males than females. She also called attention to the fact that in recent years more

---

Presented before the Section on Public Health at the 78th Annual Meeting of the California Medical Association, Los Angeles, May 8-11, 1949.

* From a study made by M. A. Gifford, M.D., for the Kern County Health Department.

† J. Kirshbaum, M.D., who then was pathologist at Kern General Hospital.

of the non-granulomatous, non-fatal type of coccidioidal disease had been reported and that more of these cases were reported in women than in men.

In the present study of 53 cases of coccidioidal meningitis few changes were noted with regard to factors of incidence relative to age, race, sex, occupation and area of habitation. Once more endemic foci have been shown in rural areas about Bakersfield, Delano, Shafter, Arvin, Wasco, and the Greenfield and Lakebottom areas. Fifty per cent of these cases of coccidioidomycosis of the meninges occurred in persons employed in the agricultural industry. More than 80 per cent of the patients who died were engaged in work in which dust could well have been an occupational hazard.

In the series here under consideration, the diagnosis was established by various means—by history, physical findings, laboratory studies, biopsy, and autopsy. A high index of clinical suspicion was developed as a result of the frequently common findings in the typical cases of coccidioidal meningitis.

Headache, often severe, persistent and resistant to routine treatment, was one of the common symptoms in the older patients; there were only a few who did not have frontal and occipital headache. (In many cases this symptom was relieved by timely aspiration of spinal fluid.)

Signs of meningeal irritation were common. Severe stiffness of the neck and spasms of the neck muscles were noted in most cases. Symptoms related to the eyes consisted of photophobia, blurring of vision and diplopia. Chest and abdominal pain was less common, although when pleurisy or pneumonitis (as confirmed by x-ray) persisted, the chest pain was more severe.

Subjective mental aberrations frequently were noted in association with headache, neck stiffness, and chest pain. Loss of memory, disorientation, comatose stages, paraphasia and other mental changes were observed, particularly in the terminal stages of meningitis.

Usually there was steady fever of several degrees. In a few cases there was no febrile stage. In terminal phases and with onset of complications the fever was explosive and very high. In some cases 106° to 107° F. was observed before death.

In many of the cases the early symptoms were insidious and presented difficulty in the problem of differential diagnosis. Among the diseases that most often had to be considered in differentiation were tuberculous and influenzal meningitis, purulent bacterial disease of the meninges, poliomyelitis, arthropod-borne encephalitis, post-viral encephalitis (measles, mumps, etc.), and prodromal stages of typhoid fever, dysentery diseases and pneumonia.

In a previous study carried out by Smith, Gifford and others, it was found that positive reaction to a skin test occurred usually in nine to 11 days after onset of illness with coccidioidomycosis. However, in cases of coccidioidomycosis of the meninges, since the disease was a part of a chronic disseminated pattern, it was noted that many of the patients were anergic. In only three such cases was there positive reaction, and in all three it occurred during the terminal month of illness. Although in most of the cases both mantoux and coccidioidin skin tests were done as early as possible after coccidioidomycosis was suspected, by and large the skin tests were of little value in making the final diagnosis. In two cases of coccidioidal meningitis, tuberculous and coccidioidal infection were concurrent; one of the patients had tuberculous meningitis as well as coccidioidal meningitis.

Two other very common observations in these cases were:

1. In many instances absence of evidence of lesions in x-ray films of the chest was important in helping to exclude tuberculosis. In only a few cases was there active mycotic pulmonary disease, as determined by x-ray or necropsy, at the time of death.

2. Although the primary portal of entry was pulmonary, there were no instances of cough that was more than transitory and non-productive in nature.

Results of laboratory studies were valuable aids in diagnosis. Examination of the spinal fluid was most helpful. In only one instance was the spinal fluid cell count normal; and in only one instance was the count more than 3,000 cells for each cubic mm. In about 90 per cent of the cases, cells in the spinal fluid numbered between 200 and 1,300. The spinal fluid was drawn soon after the onset of meningeal involvement. In the few instances in which the spinal fluid pressure was measured, it was above normal; commonly, 270 to 300 mm. of water was noted as the initial pressure. The pressure was reduced upon the removal of 15 to 30 cc. of fluid. In the average case the fluid was slightly cloudy to clear; in some instances it was xanthochromic or light green and of gelatinous consistency. In two cases in which clear spinal fluid was incubated for 24 to 48 hours a fungoid growth (later identified as coccidioides immitis) was obtained. In some cases a very heavy pellicle formed in the specimen of fluid within 24 hours, but in only one such instance was coccidioides immitis isolated. In seven cases the diagnosis was established by growth on cultures of gastric washings. Examination of direct smears and results of cultures on Sabaroud's media and other media frequently disclosed no coccidioides.

In tests on the spinal fluid, the colloidal gold curve was significant. In about 90 per cent of the cases there were colorimetric changes to the left of the color zone similar to that seen in paresis.

In only a few cases did coccidioidomycosis develop in guinea pigs that were inoculated with spinal fluid from the patients. Total protein content of the spinal fluid was abnormally high in more than 75 per cent of cases. In the spinal fluid of some patients the total protein was 150 mg. or more per 100 cc. The differential cell count of fluid taken in the early stages of illness showed up to 100 per cent polymorphonuclear cells in some instances. Frequently there was a preponderance of polymorphonuclear cells in early specimens, with a gradual decrease later and a corresponding increase in lymphocytes. Almost complete spinal fluid block was observed clinically in two cases, and in one of the two, postmortem examinations proved this clinical assumption to have been correct. The number of cells in the spinal fluid did not have any direct relation to the severity of the illness.

Results of urinalysis were not of definite diagnostic help. Blood cell counts, which were done routinely in many instances, showed little diagnostic value. Leukocytes frequently numbered between 10,000 and 14,000, with polymorphonuclear cells relatively increased in number. In a few cases eosinophilia was noted in differential count of leukocytes. Secondary anemia was noted in a few instances.

The sedimentation rate of blood taken from the more acutely ill patients was accelerated, and this information was of some value in determining prognosis. The greatest value gleaned from determination of sedimentation rate, however, lay in the help it gave toward completion of diagnosis and, in some cases, in excluding other than the correct diagnosis.

Serology tests done on serial specimens of blood and spinal fluid sent to Stanford University School of Medicine were helpful. In serial dilution, precipitin and complement fixation antibodies were observed in many cases. Complement fixation antibodies were last to appear, and the persistence of antibodies, especially in high dilution, sounded a serious prognostic note. With few exceptions, heavy antibody formation was associated with clinical severity of the illness.

X-ray findings of disease in the chest and other areas, particularly bone, were helpful in those cases in which the disease was widely disseminated. Furthermore, roentgenologic evidence of pulmonary cavities due to coccidioidomycosis was profoundly important, for in no case of meningitis due to coccidioides was there pulmonary cavity formation. When pulmonary cavity formation existed in coccidioidal infection, the course of illness was benign.

In the fatal cases of coccidioidal meningitis in the present series, the duration of the illness varied from six weeks to about two years. Of the 53 patients, 15 died within three months after onset of acute illness, 23 within 12 months; seven lived more than one year and two lived almost two years. In three cases the duration of illness was not known, and three patients known to have coccidioidal meningitis are still living.

AUTOPSY

In 35 of the 53 cases the presence of coccidioidomycosis of the meninges was confirmed by postmortem findings. In each instance most of the pathologic changes noted were at the base of the brain and in the meninges. It was noted generally that the meninges were thickened and edematous and the vessels hyperemic. In many of the cases there was a definite exudate over much of the total brain area. The exudate, in a number of cases, surrounded the nerve roots. In those cases in which the disease had been of the more chronic nature, very frequently the convolutions of the brain were thickened and the meninges were thin. On examination of sections it was noted that the ventricles in most instances were dilated and filled with clear or straw-colored spinal fluid.

Epithelioid cells were frequently noted in microscopic studies of exudate from the base of the brain, the pons and the medulla. Heavy infiltrations of plasma cells, round cells and eosinophilic leukocytes were a common observation. There were frequently scattered giant cells. In some instances the coccidioides spherules were conspicuous, in others not. Areas of necrosis and numerous elements of fibrocellular proliferation were observed in some of the sectioned material.

Post Office Box 997.

REFERENCES

1. Gifford, M. A.: Coccidioidomycosis, Kern County, for the Session on Fungus Infections, Sixth Pacific Science Congress of the Pacific Science Association, August 2, 1939.

2. Smith, C. E.: Coccidioides immitis, Farlowia, 2:199, July 1943.

3. Smith, C. E.: Recent progress in pulmonary mycotic infections, California Medicine, 67:179, September 1947.

4. Smith, C. E., Beard, R. R., Rosenberger, H. G., and Whiting, E. G.: Effect of season and dust control on coccidioidomycosis, J.A.M.A., 132:833, Dec. 7, 1946.

5. Smith, C. E., Beard, R. R., Whiting, E. G., and Rosenberger, H. G.: Varieties of coccidioidal infection in relation to the epidemiology and control of the diseases, Am. J. Pub. Health, 36:1394, December 1946.

Pathology and the Pathologist in the Cancer Program

William O. Russell, M.D., and J. Louis Neff, F.A.P.H.A., *Houston, Texas*

SUMMARY

Cancer as one of the most important human diseases does not present as formidable a problem as infectious disease did a century ago. The diversified cancer program, combining voluntary and governmental agencies in support of research, education and coordinated teamwork in the clinical care of the patient, presents a varied although unified approach to the problem that has never before been available for the study of any single human disease. Pathology, with its applied methods from the basic sciences, has a singular role in the scientific aspect of the cancer program. Representing a new specialty in medicine and embodying an inquiring approach to the study of human disease, pathology has a leading role to play. The pathologist, assuming the new role of "pathologist-physician" brings to the clinical care of the cancer patient the most precise methods of cancer diagnosis. The "pathologist-physician" should be a pivotal member of the "clinical team" in the immediate diagnosis, care and treatment of the cancer patient.

HUMAN life is one of the most precious things in the world and the responsibility for its care is largely in the hands of the medical profession. Much of the future progress, destiny, and happiness of the human race is, to a great extent, dependent upon the progress made by medical science in the knowledge and understanding of human diseases. For centuries man has stood in awe of human illness and cloaked his existence with all manner of superstition to compensate for his inadequacy in the comprehension of the basic knowledge of the factors that control his existence on this earth. The history of the 20th century will have many important events to be chronicled by historians, let us say, in the year 2500 A.D. We have already seen in the first half of this century such noteworthy things as two world wars (each contributing, we hope, to the advancement of individual freedoms and rights) and, of course, the explosion of the atomic bomb. These events loom large and overwhelmingly significant to us at the moment, and a majority of opinion now would regard the atomic bomb as the most notorious accomplishment of man. It is entirely possible, however, that the historian of the year 2500, having the background and perspective of several hundred years when reviewing the events of the 20th century, will pass by all of these and list as the most important human achievement of the century the discovery of the causes of certain important diseases, as this knowledge may have proved helpful in the prevention of premature death and the sparing of human pain and misery.

What has provided the impetus for this advance in the knowledge of human disease that may rival the atomic bomb for posterity's acclaim of human accomplishment, and what have been the methods used to attain such noteworthy advancements? To break through the veil of superstition that attended such basic biologic events in the life of man as death and birth, that was so prevalent in the middle ages, has taken one basic quality of human thought working slowly over the centuries. This is the inquiring human mind that has asked repeatedly the one-word question, "Why?" The most successful method has been the joining of human minds and social agencies in pitched battle against individual diseases or groups of diseases. The result has been smashing victories on many fronts. One hundred years ago, 80 out of every hundred persons died of some infectious disease before the age of 40, and now, 80 out of every hundred live beyond the age of 40.[9]

It is the purpose of this communication to discuss the important role of one branch of medical science epitomizing the inquiring attitude of medicine and its qualified medical specialist in a planned attack on one of the now most prevalent and serious of human diseases. That disease is cancer; the specialty is pathology; the specialist is the pathologist; and the planned attack is the organized effort of scientific and governmental agencies participating in the cancer program.

THE DISEASE (CANCER)

Cancer today is the second leading cause of death in the United States.[12] It is, however, a much less formidable problem than any of the important infectious diseases were a century ago, before the establishment of the concept of their cause from an infectious agent transmitted from one person to another. Cancer, for example, does not have the striking power against man of such uncontrolled infectious diseases as cholera, dysentery, plague and yellow fever that have so frequently altered the destiny of nations and whole races of people by deci-

---

Presented before the Section on Pathology and Bacteriology at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

From the Department of Pathology of the University of Texas Postgraduate School of Medicine, the M. D. Anderson Hospital for Cancer Research, the Department of Pathology, Baylor University College of Medicine, and The American Cancer Society, Texas Division.

mating armies and civilian populations. Although no common denominator for the causation of cancer has been established, important factors in the genesis of certain types of cancer are well recognized; viruses, x-rays, radium rays, ultraviolet rays, carcinogenic substances associated with certain occupations, intrinsic factors such as heredity, endocrine factors and fetal rests are only a few. Therapy for cancer now, although far from adequate, has much more to offer the patient than the accepted forms of therapy which were available to patients suffering from cholera, dysentery, plague and yellow fever in the past century. The general problem of cancer regarding its causation and therapy may be tersely stated as presenting a less formidable apparent barrier for a final solution than was presented by the infectious diseases in the last century. Today, we have much more fundamental knowledge upon which to base an attack.

THE SPECIALTY (PATHOLOGY)

Pathology is one of the newest specialties of medicine. It has claimed full-time practitioners of medicine working and recognized in the field for less than 40 years. Although pathology may be thought of as meaning "the study of disease," the science has come to have a much wider application to the practice of medicine, for which reason a fuller and more meaningful definition is applicable. Pathology has been best defined as "that branch of medicine which deals with the causes, the processes and the effects of disease."[3, 4]

The processes of disease involve the concepts of pathogenesis, and effects of disease are seen as clinical symptoms. In short, pathology is the science dealing with the questions concerning disease, asking, "where?", "why?", "how?", "what?", and "whether?" It has been this inquiring quality of thought and mind that has resulted in the major advances in the understanding, prevention and treatment of disease. The results of these attitudes and approaches in the understanding of human illness now being crystallized into the new specialty of pathology have largely paralleled the advances of scientific medical knowledge and the progress made in the diagnosis and treatment of disease.

THE SPECIALIST (PATHOLOGIST)

Pathology, as practiced today, was born in the first half of the 19th century when the "inquiring human mind" of practicing physicians was not content to treat patients symptomatically for such complaints as cough, weakness, and pallor. These physicians, the first practicing pathologists, asking themselves such questions as "why" did their patient die after years of cough, expectoration, and general body emaciation, were able to find some of the answers by performing postmortem examinations on the patient to see the structural alteration of the body causing the symptoms. This was the "period of clinical correlation" and it is highly significant that in this period some of the most classical descriptions of disease were written. Among these searchers were some of the most outstanding physicians of the day, such well-known investigators as Corvisart, Laennec, Louis, and Cruveilhier in France, and Hodgkin, Bright, Addison, Adams, Corrigan and Graves in England. In short, it was the age of the "physician-pathologist."

During this "period of clinical correlation" it became quickly apparent that the science of morbid anatomy (pathologic anatomy) in its relation to the causes, pathogenesis and clinical manifestation of disease was too large a field to be carried as a side activity for practicing physicians. It was at this time that the occasional man turned his entire medical practice to the performing of autopsies and the study of disease. In England, it was Robert Carswell; in Berlin, Rudolf Virchow; and in Vienna, Carl Rokitansky. With further development of the specialty of pathology there have been added besides straight, morbid anatomy for the purpose of clinical correlation, physiology, bacteriology, serology, and biochemistry, as these sciences may be applied to the practice of medicine. The pathologist, therefore, is a medical specialist who is integrating factual and definitive information obtained from his tests involving the basic sciences of medicine with clinical information in a more precise and scientific approach to the diagnosis of disease and the treatment and care of the patient than was ever possible before.

It would seem then that, if the pathologist is utilized in the fullest application of his specialty, the complete change from the "physician-pathologist" of the days of Bright, Addison and Laennec has been made and now he is the "pathologist-physician." The full significance and meaning of this is that now the physician-specialist, skilled and learned in the basic sciences of medicine, has returned to the practice of medicine as a fully qualified medical specialist.

THE CANCER PROGRAM (A COORDINATED ATTACK ON A DISEASE)

One of the best examples of a coordinated attack upon a human disease leading to the conquering of that disease was the work of the Yellow Fever Commission, which in 1900 was directed by the Surgeon General of the Unted States to visit Havana, Cuba, and investigate the cause of a large epidemic of yellow fever. The members of the Commission, Walter Reed, James Carroll, Jesse W. Lazear and Aristides Agromonte, were to solve one of the then most baffling of mysteries, when they discovered that the disease was caused by an ultramicroscopic filter-passing agent and was transmitted by a mosquito.[11] It was the joining of these minds in a local battle with a specific epidemic of the disease that produced the most significant single advance. The preparation of a prophylactic vaccine[10] followed, and it, together with the knowledge of the causative agent and vector, rendered this disease impotent as a major threat to human life in any civilized community.

Today, there are much greater forces mobilized and attacking the "disease cancer" than was possible by the Surgeon General's Yellow Fever Commission in 1900, yet in less than a generation that disease was rendered impotent by frontal attack of well-conceived scientific procedure.

The impetus for the attack on cancer came from a voluntary, unofficial agency. The American Cancer Society, formerly known as the American Society for the Control of Cancer, was organized in 1913 by a group of physicians and other scientists who believed that the sum of the existing knowledge available for cancer control was not being utilized effectively because of ignorance on the part of the public and indifference on the part of the profession. Through their zeal and enthusiasm, the possibility of improving the cancer situation was dramatized to the point that federal, state, and local health agencies, medical schools and medical societies, as well as literally thousands of individuals, were enlisted in the fight. Funds raised by the society were matched by tax funds on a broad scale until the point has been reached where cancer research today is being pursued on a scale never previously contemplated. In addition to greatly stimulated programs of research, supported by governmental agencies, by private philanthropies, and local cancer groups, the American Cancer Society, from 1945 to 1948, has allotted no less than $9,679,000 for the research aspect of its program alone.[7]

In the field of education, in addition to increased enlightenment and interest on the part of the public, much is being done to coordinate and improve the teaching of cancer in medical schools. The long-range goal is the ultimate better care of the cancer patient resulting from an increased interest in the cancer problem on the part of the medical profession. In this regard it is particularly significant that in the medical literature the field has warranted the preparation of special indices.

There are now six publications for the indexing and/or abstracting of cancer literature. These are as follows:

1. Wolfe's Lebre von der Krebskrankheit (1907-1928).
2. Index to Literature of Experimental Cancer Research (1900-1935 Donner Foundation).
3. Index Analyticus Cancerologae (1927 to present).
4. Zeitschrift fur Krebsforschung (1903 to present).
5. Index to Current Periodical Literature on Neoplastic Disease (Louisiana State Division of the American Cancer Society, 1946 to present).
6. Cancer Current Literature (The American Cancer Society, 1947 to present).

That there is need for special indices and abstractings of articles on cancer is understandable, for there are over 15 medical journals devoted to cancer. No other single disease has such recognition in the medical literature.

The keynote of the cancer program is teamwork; teamwork between the official and voluntary agencies; teamwork between the medical profession and the agencies; teamwork between the patient and the patient's medical advisors; teamwork between the general practitioner and his specialist-consultants.[1, 6, 5, 3] Whether it be in the research laboratory, the university medical school or in the practice of hospital or private pathology, the pathologist, having the ubiquitous approach to scientific medical problems and being able to bring the most precise and accurate methods for the diagnosis of disease, is probably the most indispensable member of the cancer team. Pathology as a science has no methods of its own but applies the methods and procedures of the anatomist, the chemist, the physiologist and the microbiologist. When this fact is thoroughly appreciated and understood there is no limit to the application of the science to the study of a disease, and the contribution that can be made to the attack upon a single disease such as cancer is likewise unlimited.

THE PATHOLOGIST AND PATHOLOGY IN THE CARE OF THE CANCER PATIENT

The education program of the American Cancer Society, in all its manifestations, has emphasized that the patient should consult a physician for the most trivial symptoms, that cancer might be diagnosed in its incipient stages, to allow the maximal opportunity for the cure of the disease.[2] Obviously, this must be done even at the risk of creating undue apprehension in certain types of personality and at the risk of being accused of creating "cancerphobia." There is nothing truer than the Cancer Society's statement that "cancerphobia" is much easier to cure than metastatic carcinoma. We must be prepared for the occasional disturbed patient in order to attract the many curable patients now permitted to go their way undiagnosed. The plea is made to the general practitioner to be tolerant toward the patient whose trivial symptoms prove to be inconsequential.[6] We must also make a plea to the pathologist that he in turn be tolerant toward the general practitioner who persistently submits negative specimens, always remembering that the more curable the cancer the more difficult it is to diagnose and the more inconclusive the clinical evidence. The pathologist has been urged to make available to the practitioner of clinical medicine the most rapid and accurate methods of diagnosis of cancer. The pathologist, therefore, is an important member of a "clinical team." To bring the benefits of his specialty to their greatest usefulness in the care and treatment of the patient, the following suggestions are offered:

Tumor Clinics and Tumor Boards: Tumor clinics and boards serve their highest purpose and usefulness in that they provide opportunity for the correlated discussion of cancer cases by pathologist, radiologist, surgeon, internist and other specialists regarding the care and disposition of the cancer patient.[3] By the providing of jury opinion rather than judge decision in the care and disposition of cancer patients, the level of cancer therapy is immeasurably improved. The pathologist should be a leader in the tumor clinic[8] since by virtue of his training and background in the basic sciences of medicine he brings an integrative and interpretive science to the "clinical team."

Tissue Diagnosis and Operating Room Consultation: This is a medical diagnostic service of phenomenal accuracy. The correct diagnosis of cancer is made in 98 per cent of cases when cancerous tissue is given to a qualified pathologist. This degree of accuracy in medical diagnosis is rarely equalled by other specialists in selected diseases. When in the operating room for consultation and frozen section diagnosis, the pathologist has unusual opportunity to bring the methodology of the science of pathology to its greatest fruition in the care of the cancer patient. He should allocate the maximal amount of his professional time for this kind of work since it provides golden opportunity for him to personally participate in the professional care of the patient with his professional colleagues. By this collaboration they will better appreciate the benefits to be gained by consultation with a medical specialist whose background and training are so fundamental and basic to the understanding of all medical problems. In this activity the pathologist is assuming the full role of "pathologist-physician"—a sharp contrast with the role of the first pathologists who were "physician-pathologists."

Obligation to the Medically Indigent Patient: The pathologist should serve the cancer patient in the same relationship as other physicians. In part-pay and indigent clinic practice the professional services of the pathologist should be given in accordance with the dictated customs of the other types of medical practice. Where his professional services are dispensed through non-professional channels, and particularly where he is in a master-servant relationship with lay authorities, the pathologist is hindered in giving his maximal value to the "cancer team," and the care of the cancer patient will consequently suffer.

IMPROVED TECHNIQUES AND DIAGNOSTIC TESTS IN THE DIAGNOSIS OF CANCER

The pathologist has the greatest responsibility of any specialist in the spectrum of medical practice to bring to the practicing profession the latest tests and methodology in the diagnosis of disease. Upon his choice and evaluation of methods used in his laboratory is dependent how rapidly advances in medical therapy reach the level of medical practice in the community. This is particularly true in the care of the cancer patient. Clinical laboratory diagnostic tests for cancer are constantly being suggested. The pathologist must be prepared to evaluate them, rejecting impractical and unsound procedure, yet rapidly instituting new methods if he feels they are desirable. In this function the pathologist largely controls the flow of scientific advances to the medical community. A stubborn refusal to investigate or adopt new methods of proven value cannot be justified by a true scientist.

Postgraduate Medical Education: By virtue of his intermediate position between the basic sciences of medicine and the clinical practice of medicine, the pathologist is in a preferred position to take the lead in educational activities. By being a leader in academic exercise in the medical community, he helps improve the general level of medical practice. In the final analysis every pathologist is a postgraduate medical educator, since in many instances he is the first contact the practicing physician has with new developments in the basic sciences of medicine. Great contribution can be made by the pathologist in the careful study of individual tumors and obtaining maximal information applicable to the individual case by participation in national and local tumor registries. If the tumor cases are properly recorded in a central agency for the collection of pathologic material and related clinical and laboratory data, then the collected material, besides providing opportunity for extended research regarding the life history of a given tumor, will provide material for individual research and a source of new information for tumor diagnoses.

REFERENCES

1. American Cancer Society: (1) Teamwork in Cancer Diagnosis; (2) The General Practitioner and the Cancer Patient.

2. American Cancer Society: Pamphlets such as: "How Your Doctor Detects Cancer"; "Guard Those You Love"; "Who, What, Why, Where, When of Cancer." Motion pictures of the American Cancer Society such as: "Traitor Within"; "A Question in Time"; "The Doctor Speaks His Mind."

3. Crowell, B. C., and Branch, C. F.: Cancer clinics; cancer diagnostic clinics; cancer detection centers; minimum standards and their amplification, Bulletin of American College of Surgeons, June 1947.

4. Moore, R. A.: Textbook of Pathology, Philadelphia and London, 1944, W. B. Saunders Co.

5. Neff, J. L.: The organization and function of a tumor clinic, Texas Reports of Biology and Medicine, 5:199-208 (Summer), 1947.

6. Neff, J. L.: Teamwork in cancer control, Texas State J. of Medicine, 42:336-339, Sept. 1946.

7. Personal communication from M. R. Runyon, executive vice-president of American Cancer Society.

8. Phillips, G.: Relationship of the pathologist to the tumor clinic program, Texas State J. of Medicine, 43:617-620, 1948.

9. Report of the Sanitary Commisison of Massachusetts, 1850: Boston, Dutton and Wentworth, State Printers.

10. Sellards, A. W., and Laigret, J.: Vaccination de l'homme contre la fievre jaune, C. R. Acad. Sci., 194, 1609, 1932a. Quoted by Strong, R. P.: Diagnosis, prevention and treatment of tropical diseases, Philadelphia, 1942, Blakiston Co.

11. U. S. Senate Document (1911) quoted by Strong, R. P.: Diagnosis, prevention and treatment of tropical diseases, Philadelphia, 1942, Blakiston Co.

12. Vital Statistics in the United States, Volume 1945, Bureau of the Census.

CASE REPORTS

- An Early Fatal Case of Infantile Toxoplasmosis in California
- Pancreatic Cysts Simulating Carcinoma of the Head of the Pancreas
- Anaphylactic Shock Following Intravenous Administration of Thiamine Chloride
- Allergic Parotitis

An Early Fatal Case of Infantile Toxoplasmosis In California

Jacob Karl Frenkel, M.D., and Howard C. Naffziger, M.D., *San Francisco**

It is the purpose of this presentation to report a case of toxoplasmosis in an infant from California, believed to be the earliest on record in the United States.

Neonatal cases of toxoplasmosis are being reported with greater frequency. Nearly 40 such cases, proven either by isolation of the organism, by autopsy, or by both methods, have been reported to date.[3,12] Clinically, toxoplasmosis in the newborn may manifest itself by enlargement of the head due to internal hydrocephalus, by chorioretinitis, and by signs of central nervous system irritation, such as convulsions, spasticity, reflex changes and hypothermia. On ventricular puncture, xanthochromic fluid of high protein content (grams per 100 cc.) is usually obtained. Occasionally, toxoplasma can be visibly demonstrated in such fluid. More successful, usually, are attempts at isolation of the organism by animal inoculation.

The protein and cell contents of the subarachnoid and spinal fluid are likewise increased. However, the protein levels are in the range of hundreds of milligrams per 100 cc., rather than the thousands of milligrams per 100 cc. as in the ventricular fluid. On radiological examination of the skull, intracerebral calcifications may be found. The latter are not as common, however, as chorioretinitis, which has been found in almost every neonatal case of toxoplasmosis, properly investigated.

Such are the signs and symptoms of most of the fatal cases described.[10] However, in a few cases of neonatal toxoplasmosis there have been manifestations of disease referable mainly to the extraneural viscera, such as icterus due to hepatitis, anemia and disturbance of growth.[7,8,16] Here again, chorioretinitis is usually present, and on autopsy a diffuse involvement of all of the viscera has been found.[7,8] Nevertheless, many of the infants showing the latter symptom complex survive,[1,4] and it is this symptom complex that is sometimes elicited in children with signs of chronic toxoplasmosis dating back to early infancy. Those infants showing signs and symptoms referable to the central nervous system are thought to have passed through a state of generalized visceral infection earlier, usually *in utero,* after acquiring the infection by the transplacental route.[3]

The causative organism, *Toxoplasma gondii,* is generally regarded to be a protozoan. Its name is derived from the Greek *toxon,* meaning a bow or arc, and referring to the lunate shape of the organism in the fresh state. The specific name *gondii* is derived from the name of the host in which the organism was first observed. This was the gondi (*Ctenodactylus gondi,* Pallas, 1778), a small North African rodent, which was used as a laboratory animal at the Institute Pasteur of Tunis and from which Nicolle and Manceaux first described toxoplasma in 1908 and 1909.[6] The organism is known only to reproduce by binary fission. Proliferative forms and so-called "pseudocysts" can be distinguished. The individual organisms usually appear spherical on sections. The early literature on toxoplasmosis has been reviewed by Sabin[10] and Weinman.[11]

Recently, one of the authors (J.K.F.) observed two and collected reports of two further cases of fatal neonatal toxoplasmosis. When these cases were presented and were discussed by the other author (H.C.N.) he recalled a similar case, which he had observed 26 years ago. Slides, paraffin-blocks, as well as the eyes of the baby had been preserved, so it was not difficult to make the diagnosis even at this late date. Fortunately, too, the baby's parents could be contacted and they were kind enough to submit to skin and serological tests for toxoplasmosis.

CASE REPORT

The patient was born prematurely at Adler's Sanitarium, San Francisco, in 1923. The head was enlarged, the fontanelles were bulging and the cranial sutures were separated. Right microphthalmia was noted. Surgical incision through the scalp overlying the anterior fontanelle revealed a tense bulging dura. The convolutions were not remarkable. Puncture of both ventricles revealed thick and yellow fluid. The temperature was unstable and the baby died at the age of five days.

Autopsy Findings. The body was that of an underdeveloped male infant without rigor mortis. The fontanelles and sutures of the cranial bones were widely open. Over the anterior fontanelle, a silver foil dressing closing a recent 3 cm. long incision was present. The right eye was distinctly smaller than the left. No significant gross findings were noted regarding the thoracic and abdominal viscera. On removal of the brain from the calvarium a large amount of yellowish fluid was found, containing several large accumulations of thick, tenacious material and small fat droplets. The cerebral hemispheres collapsed during removal. The brain was small and had a yellowish appearance, with a number of white, somewhat granular areas. There was microgyria of the right occipital lobe.

Microscopic sections of the heart showed several foci of subsiding myocarditis (Figure 1). Mild interstitial pneumonitis, slight hepatitis, splenitis and interstitial nephritis were present. In both eyes, foci of retinal degeneration. cellular infiltration and toxoplasma were observed (Figures 2 and 3). No brain material had been saved. A more detailed histopathological report will be made at a later date.

From the Divisions of Pathology and Neurosurgery, University of California Medical School, San Francisco.

*Dr. Frenkel's present address: Rocky Mountain Laboratory, Hamilton, Montana.

Skin Tests and Serological Findings on the Parents. Twenty-five years after giving birth to the patient the mother proved to have positive reaction for Toxoplasma gondii by both the toxoplasmin skin test[2] and the toxoplasma neutralizing antibody test. The latter was positive as performed in the rabbit skin,[9] and an in vitro titer of 1:64 was obtained.[11] Reaction to skin test of the father, while negative at 40 hours, turned positive after 72 hours, and serum from the father likewise showed the presence of toxoplasma-neutralizing antibodies, both as demonstrated on the rabbit skin and in vitro (1:16). Neither of the parents' sera contained toxoplasma complement-fixing antibodies.[13]

COMMENT

Except for the first well-authenticated case reported by Jankû from Prague, Czechoslovakia, in 1923,[5] the case reported herein is the earliest case of toxoplasmosis diagnosed from pathological material. Of course, without knowledge of the pioneer work of Wolf and Cowen[15] and of Sabin[10] and others, the diagnosis would not have been made at the present time.

The advanced lesions of toxoplasmosis observed in the patient at the age of five days are evidence of antenatal inception of the disease. Certain evidence has been collected[3] to support the thesis that most mothers when transmitting the disease are in the acute stage of toxoplasmic infection, rather than in a stage of latent chronicity, which is thought to follow the acute stage. The mother in this case was stated to have had pernicious vomiting of pregnancy while carrying the patient. However, although she had similar symptoms during a subsequent pregnancy, she gave birth to a normal child.

It was of interest to note the positive reaction to skin tests and the presence of neutralizing antibodies in the blood

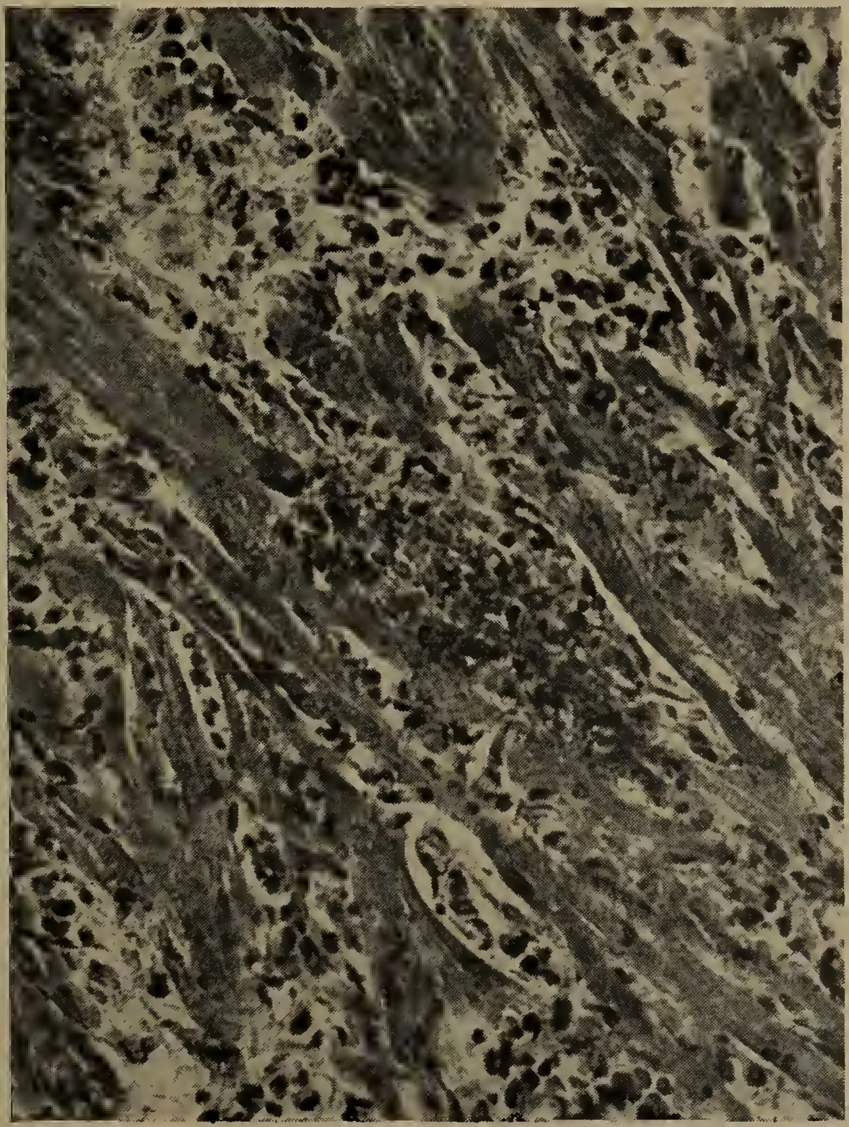


Figure 1.—Myocardial fibers showing necrosis, and infiltration by lymphocytes, plasma cells and larger mononuclear wandering cells; the endomysial fibroblasts are proliferating. Hematoxylin and eosin (x 325).

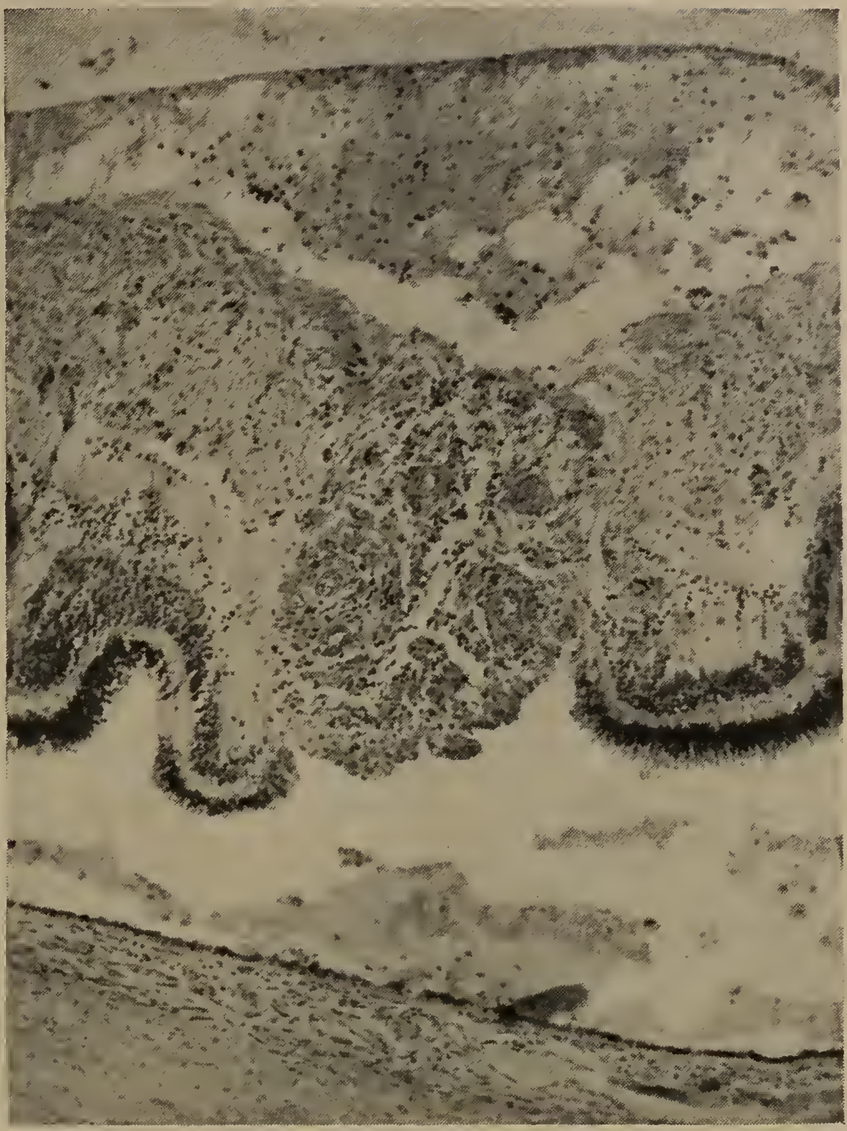


Figure 2.—Granulomatous retinitis (center) and slight choroiditis (below) with cellular exudate in vitreous (top) and between retina and choroid. Hematoxylin and eosin (x 80).

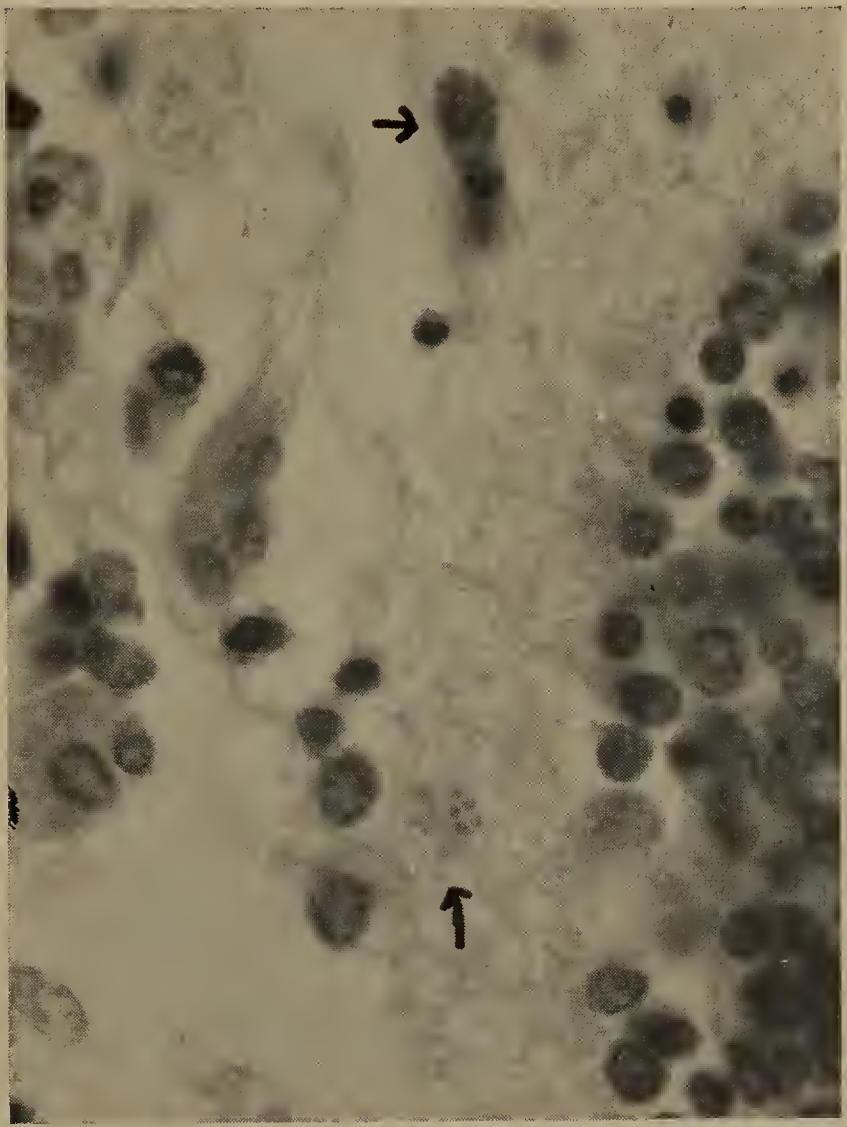


Figure 3.—Close-up of right center margin of area in Figure 2, showing two groups of toxoplasma in the outer fiber layer of the retina. Hematoxylin and eosin (x 845).

obtained from the parents. The date of the infection could not be determined. Such positive laboratory evidence of past toxoplasmic infection is frequently obtained in persons in an older age group.[2] A negative reaction to a toxoplasma complement-fixation test does not vitiate this observation, since such antibodies seem to disappear shortly after infection or the last contact with the antigen.[13, 3]

SUMMARY

A patient with congenital toxoplasmosis, fatal at five days of age, has been presented. The case is thought to be the earliest on record in the United States. The patient was observed at San Francisco, California, in 1923, and the diagnosis was made recently by finding toxoplasma and specific lesions in the pathologic material saved. Both parents, when examined in 1948, had positive reaction to the toxoplasmin skin test and the toxoplasma neutralizing antibody test.

REFERENCES

1. Cowen, D., Wolf, A., and Paige, B. H.: Toxoplasmic encephalomyelitis. VI. Clinical diagnosis of infantile or congenital toxoplasmosis; survival beyond infancy, Arch. Neurol. & Psychiat., 48:689-739, November 1942.

2. Frenkel, J. K.: Dermal hypersensitivity to toxoplasma antigens (toxoplasmins), Proc. Soc. Exp. Biol. & Med., 68: 634-639, July-August 1948.

3. Frenkel, J. K.: The pathogenesis, diagnosis and treatment of human toxoplasmosis, J.A.M.A., 140:369-377, May 28, 1949.

4. Frenkel, J. K.: Unpublished observations.

5. Jankû, J.: Pathogenesis and pathologic anatomy of coloboma of the macula lutea in an eye of normal dimensions and in a microphthalmic eye with parasites in the retina, Casop. lek. cesk., 62:1021, 1052, 1081, 1111, 1138, 1923.

6. Nicolle, M. M. C., and Manceaux, L.: Sur un protozoaire nouveau du gondi (*Toxoplasma* n.g.), Inst. Pasteur Tunis, Archives, 4:97-103, 1909.

7. Paige, B. H., Cowen, D., and Wolf, A.: Toxoplasmic encephalomyelitis. V. Further observations of infantile toxoplasmosis; intrauterine inception of the disease; visceral manifestations; case 5, Am. J. Dis. Child., 63:474-514, March 1942.

8. Pratt-Thomas, H. R., and Cannon, W. M.: Systemic infantile toxoplasmosis, Am. J. Path., 22:779-795, July 1946.

9. Sabin, A. B.: Toxoplasma neutralizing antibody in human beings and morbid conditions associated with it, Proc. Soc. Exp. Biol. & Med., 51:6-10, 1942.

10. Sabin, A. B.: Toxoplasmosis, a recently recognized disease of human beings, Adv. in Pediatrics, 1:1-60, Interscience Publishers, New York, 1942.

11. Sabin, A. B., and Feldman, H. A.: Dyes as microchemical indicators of a new immunity phenomenon affecting a protozoan parasite (Toxoplasma), Science, 108:660, Dec. 10, 1948.

12. Schwarz, G. A., Rose, E. K., and Fry, W. E.: Toxoplasmic encephalomyelitis. A clinical report of six cases, Pediatrics, 1:478-494, April 1948.

13. Warren, J., and Sabin, A. B.: The complement fixation reaction in toxoplasmic infection, Proc. Soc. Exp. Biol. & Med., 51:11-14, 1942.

14. Weinman, D.: Human toxoplasma, Puerto Rico J. Pub. Health & Trop. Med., 20:125-161, December 1944.

15. Wolf, A., and Cowen, D.: Granulomatous encephalomyelitis due to an encephalitozoon (Encephalitozoic encephalomyelitis). A new protozoan disease of man, Bul. Neur. Inst. N. Y., 6:306-371, July 1937.

16. Zuelzer, W. W.: Infantile toxoplasmosis. With a report of three new cases, including two in which the patients were identical twins, Arch. Path., 38:1-19, July 1944.

Pancreatic Cysts Simulating Carcinoma of the Head of the Pancreas

Report of Two Cases

CARLETON MATHEWSON, JR., M.D., and ROY COHN, M.D.,
San Francisco

PANCREATICODUODENECTOMY as originally advocated in 1935 by Whipple[1] and his associates for the radical treatment of carcinoma of the papilla of Vater and the head of the pancreas has now become a recognized procedure. Although the early attempts to carry out this radical operation were associated with a high operative mortality, a better understanding of technique and of preoperative and postoperative care have made possible the radical resection of tumors involving the common bile duct, duodenum and head of the pancreas previously considered inoperable.

A number of modifications of the original two-stage operation as performed by Whipple have been made. With the use of vitamin K and blood transfusions to control hemorrhage and anemia, the trend is now toward a one-stage operation. Most surgeons now reimplant the cut end of the pancreas or pancreatic duct into the upper intestine to preserve the external pancreatic secretion, whereas Whipple considered this unnecessary and one of the main hazards of the procedure. Other modifications of the original procedure have to do mainly with the type and position of the anastomosis made to reestablish continuity and still prevent stenosis and troublesome regurgitation of bowel contents into the biliary tree.

With the technical problems solved, the main difficulty confronting the surgeon at present is one of early differential diagnosis. Unfortunately, a number of conditions involving both intra- and extrahepatic biliary passages give rise to similar clinical pictures and are extremely difficult to distinguish one from another. Too often the differential diagnosis is made late and surgical treatment undertaken when surgical extirpation is no longer feasible.

In general, the main consideration in diagnosis involves the differentiation between obstructive and non-obstructive jaundice, which unfortunately is occasionally impossible. In this connection, one must always keep in mind the frequent association of the two, particularly when obstructive jaundice itself has led to secondary degenerative changes in the liver.

Obstructive lesions of the extrahepatic biliary tree, both benign and malignant, although frequently easily distinguished one from the other, may produce clinical pictures so similar that positive differentiation cannot be made without exploratory laparotomy. For this reason it becomes imperative that the surgeon be prepared to recognize and undertake the surgical management of these lesions, regardless of their nature, as they present themselves in the operating room.

Unfortunately, gross and even microscopic examination at the time of operation will not always lead to a positive diagnosis. This is particularly true of obstructing lesions of the lower end of the common bile duct. Often a stone imbedded in the common duct near the ampulla of Vater, with inflammatory reaction about it, will simulate carcinoma. Carcinoma of the ampulla may cause stricture and obstruction without gross evidence of tumor. Inflammatory lesions of the pancreas often cause common duct obstruction and are grossly indistinguishable from carcinoma of the head of the pancreas, even with aid of frozen sections made at the time of operation.

From the Department of Surgery, Stanford University School of Medicine, San Francisco.

Presented before the Section on General Surgery at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

The purpose of this communication is to report two cases of benign cysts of the head of the pancreas. In one case the cyst was inflammatory in nature, and in the other apparently obstructive in origin. Intermittent obstruction of the common bile duct and jaundice were caused in both cases. The gross pathologic changes in each case at operation were indistinguishable from those of carcinoma of the head of the pancreas. Both of the patients were subjected to radical partial pancreaticoduodenectomy, one in a single-stage operation and the other in a two-stage procedure, under the mistaken diagnosis of carcinoma of the head of the pancreas. Both patients recovered uneventfully from the operation and are living and well.

CASE REPORTS

Case 1: The patient, a male 40 years of age, had right subcostal pain radiating to the back, occasional nausea and vomiting and jaundice of eight weeks' duration.

On July 6, 1947, the patient started to have mid-epigastric pain about 4 or 5 p.m. For the next three days he was unable to retain food. There was occasional dull pain in the mid-epigastrium and to the right side, radiating to the back and around the right subcostal margin. At the initial examination the patient was icteric. The liver was slightly enlarged and just barely palpable below the costal margin on the right, and the spleen was not palpable. The icteric index was 55 units. Leukocytes numbered 12,000 with 71 per cent neutrophils and 22 per cent lymphocytes. Result of a test for urobilinogen in the urine was positive in 1:40 dilution. A Wassermann test was negative for syphilis. July 17, the icteric index was 12 units. The cholesterol content in the blood was 233 mg. per 100 cc. and the sugar content 105 mg. per 100 cc. The patient stated that during the first three weeks of hospitalization he had constant nausea and vomiting with pain on the right subcostal margin, radiating to the right side and to the back; and during that time the body weight had decreased 25 pounds. From June 9 to July 26 the temperature ranged between 99° and 100.5°F. daily. On July 29 there was another bout of pain. Leukocytes then numbered 16,800 with 69 per cent neutrophils and 9 per cent stab cells. The icteric index was 16 units, and the result of an indirect van den Bergh test was 6.3 mg. Gastric analysis showed 71 degrees of free acid, the fluid being positive for blood. X-ray studies of the gastrointestinal tract on July 27 revealed no deformities or intrinsic lesions of the stomach. It was felt that there was an extrinsic mass causing a defect of the greater curvature of the stomach. No abnormality was observed in a film of the chest. The gallbladder was visualized. A second gastrointestinal series on August 12 revealed a slight lateral displacement of the duodenum. The radiologist felt that there was an extrinsic mass causing external pressure on the second portion of the duodenum and greater curvature of the stomach. Results of liver function tests were within normal limits.

When the patient first came under the author's observation on September 3, 1947, slight jaundice was noted. The temperature was normal, the pulse rate 80, and the blood pressure 122 mm. of mercury systolic and 80 mm. diastolic. There was some resistance in the right rectus abdominis muscle. Presence of a palpable mass in the right upper quadrant of the abdomen was uncertain.

Results of laboratory tests accorded with those previously carried out.

On September 23 the abdomen was opened through a right subcostal oblique incision. The gallbladder was noted to be rather thickened and with Hartman's pouch settled in a mass of adhesions in the area of the common duct. A wide curve involving the first and second part of the duodenum and over the head of the pancreas was observed. In this curve of the duodenum a hard, irregular mass about the size of a small lemon was felt. It appeared to be fairly well delineated from the body and tail of the pancreas. The tissue circumjacent to this mass, which included the common duct and retroperitoneal tissues, was brawny and edematous as if involved in a prior existent inflammatory process of some type. Frozen section from the mass revealed inflammatory tissue. It was considered that it was best not to take a chance that the mass was totally inflammatory, which meant that a resection should be done. This was accordingly carried out in a single stage partial pancreaticoduodenectomy. Postoperative convalescence was uneventful.

The pathological report was "Pancreatic necrosis with cyst formation and pancreatitis."

* * *

Case 2: The patient was a male 42 years of age. The chief complaint was progressive jaundice, severe itching of skin and loss of weight over a period of three weeks. The patient had been a heavy drinker for several years but had had no alcohol for the past year.

The last week in December, 1947, diarrhea developed with five or six loose stools daily, normal in color. One week later, jaundice developed with definite fading in color of stools. In January 1948, diarrhea recurred with mild abdominal cramps. The stools were normal in color. In May 1948, progressive painless jaundice with severe itching of the skin developed and there was progressive loss of weight.

Upon physical examination it was noted that the temperature was 97.6°F. and the blood pressure was 138 mm. of mercury systolic and 90 mm. diastolic. There was intense jaundice and the sclerae were jaundiced. The liver edge was palpable two finger-breadths below the right costal margin.

Erythrocytes numbered 4,880,000. The hemoglobin value was 87 per cent. Leukocytes numbered 9,850 with normal differential of cells. There was a trace of albumin in the urine, but no sugar; six to eight leukocytes per high power field were noted, and occasional fine and coarse granular casts. A quantitative urobilinogen test was positive in 1:10 dilution. The icteric index was 50 units. There was 35 per cent retention of Bromsulfalein®. There was positive delayed reaction to van den Bergh's test, and a biphasic direct reaction. A quantitative test for bilirubin showed 1.8 mg. per 100 cc. Result of a cephalin-cholesterol flocculation test was negative. A test of the stool was positive for urobilin, negative for bilirubin.

The abdomen was opened through a right paramedian incision. The liver was found to be normal in size. It was smooth and showed no metastasis. It appeared to be congested with bile. The gallbladder was thin-walled, filled with black bile, and contained no stones. The common duct was thin-walled and distended. No stones were palpated in it. The head of the pancreas was enlarged, being about 2 cm. in diameter, and was very firm. It seemed to be freely movable. The remainder of the pancreas was fairly firm but otherwise normal. The fundus of the gallbladder seemed to lie most easily against the anterior surface of the stomach, so anastomosis was made between the gallbladder and the stomach just proximal to the pylorus. Recovery was uneventful and the jaundice cleared.

At a second operation, with the patient under continuous spinal anesthesia, a transverse upper abdominal incision was made, transecting both recti muscles. The omentum was found adherent to the old upper abdominal scar. After the omentum was freed the previous anastomosis was noted to be intact with very little peritoneal reaction about it. There were a few adhesions between the gallbladder and the transverse colon and between the liver bed and second portion of the duodenum. These were freed and the fingers introduced into the foramen of Winslow. By so doing, a large tumor mass could be felt in the head of the pancreas which seemed to be freely movable. This tumor was thought to be a carcinoma of the pancreas. A partial pancreaticoduodenectomy was performed. The patient made uneventful recovery.

The pathological report was "Cyst, pancreas, simple obstructive; cholecystitis, subacute; lymphadenitis, regional."

DISCUSSION

In retrospect it might be said that in each of the two cases presented the clinical history might have indicated the true nature of the disease and that the suspicion of carcinoma of the head of the pancreas was unwarranted. Experience has shown, however, that the clinical history is not always to be trusted and that carcinoma of the common duct, carcinoma of the ampulla of Vater and carcinoma of the head of the pancreas may be associated with painless intermittent jaundice, painless constant jaundice and painful intermittent jaundice. Moreover, the pathological findings in each of these cases make it evident that the true nature of the disease could not be determined by gross examination at the time of operation.

SUMMARY

Two cases of pancreatic cyst causing obstructive jaundice are reported.

Partial pancreaticoduodenectomy was performed in both cases, leading to complete relief of symptoms.

REFERENCES

1. Whipple, A. O., Parsons, W. B., and Mullins, C. R.: Treatment of carcinoma of the ampulla of Vater, Ann. Surg., 102:763-779, Oct. 1935.

Anaphylactic Shock Following Intravenous Administration of Thiamine Chloride

Report of a Case

L. P. Armanino, M.D., and W. S. Scott, Jr., M.D., *Stockton*

RECENTLY, severe reactions to vitamin preparations have been reported in the medical literature.[2, 3, 4, 5, 6, 7] Since these substances are currently popular and are used extensively, and as they may be potentially dangerous when employed indiscriminately, it is fitting to bring forth periodically for consideration by the medical profession certain representative cases of sensitization and to sound a word of caution.

CASE REPORT

A 39-year-old male had been given two intravenous injections of thiamine chloride for pain in the left shoulder by his wife, a nurse. After the second injection, the patient wheezed and noted some pruritus which disappeared shortly.

At 7 p.m. June 6, 1947, about four months after the second injection, a third injection of 10 mg. of thiamine chloride was administered intravenously. Within two or three minutes, the patient experienced difficulty in breathing and became cyanotic. The skin became cold and moist. The patient then started to wheeze, cough, and expectorate mucus and bloody sputum. He complained of pain in the chest and abdomen. He was hospitalized within an hour, and at this time the skin was ashen. The lungs were full of musical and coarse bubbling rales and coarse rhonchi. The blood pressure was 70 mm. of mercury systolic and 40 mm. diastolic, the pulse rate was 120, respirations 28 per minute, and rectal temperature 97° F. Blood plasma, epinephrine, and oxygen were given immediately. Around 10 p.m. copious, bloody, liquid stools were being passed and the blood pressure was unobtainable. Therapy was continued, and adrenal cortical hormone, vitamin K, and atropine sulfate were added. By 1 a.m. on June 7 the patient's color and pulse had improved, and 5 per cent dextrose in normal saline was substituted for the plasma. At 4 a.m. he was much improved, the blood pressure was 98 mm. of mercury systolic and 70 mm. diastolic, and the pulse rate was 108. The bloody diarrhea and some abdominal cramping persisted, but they seemed relieved by Kaopectate® orally. By noon on June 7, the lungs had cleared, the color of the skin was normal, and the blood pressure was 128 mm. of mercury systolic and 80 mm. diastolic. Later in the afternoon a tarry stool was passed. Up to that time the patient had been given 1,500 cc. of blood plasma, 1,000 cc. of 5 per cent dextrose in normal saline, and 3 cc. of 1:1,000 epinephrine, most of which had been given in the first five hours after entry.

On June 8, 1947, 36 hours after the thiamine chloride injection, the pulse, temperature, respirations, and blood pressure were normal. The patient was taking water by mouth, and was able to breathe outside the oxygen tent without difficulty. He was discharged on June 10 ambulatory and asymptomatic with no gross evidence of blood in the stool.

Subsequent intradermal or passive transfer tests were not carried out. At last report a year later, the patient had remained in good health. There was no history of previous allergic disease in the patient or in his family.

COMMENT

The profound reaction of this patient to parenteral thiamine chloride was more severe than usual, although deaths from anaphylactic shock have resulted from the use of this drug. The many symptoms are indicative of the widespread involvement of the tissues affected in shock. In addition to circulatory collapse, there was clinical bronchial asthma with pulmonary edema and massive hemorrhage into the gastrointestinal tract. In a case reported by Reingold and Webb[5] microscopic changes noted at autopsy included constriction of the smooth muscle of the pulmonary arteries and bronchioles, which was accompanied by pulmonary engorgement, dilatation of the right side of the heart, and pulmonary emphysema. The presence of pigmented macrophages was thought to indicate that previous hemorrhages had followed an anaphylactizing injection. The veins and sinusoids of the visceral organs were found to be engorged with blood.

In spite of the potential danger of administering vitamin preparations by injection, especially intravenously, apparently this method of administration is widely used. Although such injections may be necessary in selected patients and of psychic advantage in some instances, the oral route remains the cheapest and safest for the great majority of patients.

Every prospective recipient of parenteral vitamin preparations should be quizzed as to sensitivities and reaction to previous similar injections. In addition the use of intracutaneous tests may indicate hypersensitivity to the substances. Even during the using of them, such symptoms as sneezing, wheezing, pruritus, nausea, vomiting, swelling, shortness of breath, nervousness, tachycardia, and collapse should indicate impending danger and perhaps a change in the route of administration of the preparation.

Necessary treatment of reactions depends on the severity of them. In the case here reported, parenteral antihistaminic drugs, which were not available at the time, would have been indicated, in addition to the measures used. In less fulminating cases, epinephrine has proved adequate.[1, 5]

SUMMARY

A case of anaphylaxis following the intravenous injection of 10 mg. of thiamine chloride is presented. The importance of determining sensitivity prior to parenteral administration of the substance is stressed. Oral administration of vitamins is the safest and preferable in a great majority of subjects. Anaphylactic shock was successfully treated with epinephrine, oxygen, blood plasma, and atropine.

2633 Pacific Avenue.

REFERENCES

1. Joliffe, N. (Discussion by Schiff): Treatment of neuropsychiatric disorders with vitamins, J.A.M.A., 117:1496-1502, Nov. 1, 1941.

2. Laws, C. L.: Sensitization to thiamine hydrochloride, J.A.M.A., 117:176, July 19, 1941.

3. Pelner, L.: Anaphylaxis to the injection of nicotinic acid (niacin). Successful treatment with epinephrine, Ann. Int. Med., 26:290-294, Feb. 1947.

4. Reingold, I. M., and Webb, F. R.: Sudden death following intravenous injection of thiamine chloride, J.A.M.A., 130:491-492, Feb. 23, 1946.

5. Schiff, L.: Collapse following parenteral administration of solution of thiamine chloride, J.A.M.A., 117:609, Aug. 23, 1941.

6. Stein, W., and Morgenstein, M.: Sensitization to thiamine hydrochloride: Report of another case, Ann. Int. Med., 20:826-828, May 1944.

7. Stiles, M. H.: Hypersensitivity to thiamine chloride with a note on sensitivity to pyridoxine hydrochloride, J. Allergy, 12:507, July 1941.

Allergic Parotitis

Ralph Bookman, M.D., *Los Angeles*

THIS report is offered as further evidence that structures other than the respiratory tract, the gastrointestinal tract and the skin are subject to allergic disturbance. Such is the case in allergic disease of the parotid glands which, since first reported in 1925,[2] has been noted frequently.

Allergic parotitis affects all age groups. Cases in patients as old as 70[8] and as young as 2½ years[10] have been reported. Frequently a family history of allergic disease is noted.[10] Associated allergic disease has been observed in most well documented cases[3, 11, 12] and the presence of it certainly strengthens the diagnosis. Asthma,[8, 9, 11] urticaria, angioneurotic edema and allergic rhinitis[3, 5, 9, 12] all occur in conjunction with this condition. Specific sensitivities are varied but most patients who have the disease are sensitive to environmental allergens and to certain foods. Allergic reaction to pollens, however, is infrequently reported.[11] Sometimes an item of food will specifically precipitate an attack[12] but a seasonal history has not been reported. In the typical case, acute swelling develops either in relation to meals or upon arising in the morning. The importance of the inhalant factor may be observed in a case reported by Zindler and Frazer[12] in which attacks were precipitated when the patient handled live turkeys. In a case observed by the author, swelling developed when the patient opened a trunk full of old clothes.

The parotid swelling may involve one or both sides.[6, 12] It develops quite rapidly and lasts for from a few hours to several days. Pain is infrequent but patients may complain of a tense feeling in the cheeks, occasionally in the ears, and inability to open the jaws completely. Edema of the gland, the duct or both may occur[11] and some patients experience immediate relief following a spurt of saliva into the mouth. When examined during an attack, the gland is palpable but usually soft and non-tender. The orifice of Stensen's duct does not appear abnormal and clear saliva may be milked out. A stained smear of parotid secretion will often show many eosinophils, although their presence is not essential for diagnosis. X-ray studies of the area should be carried out in all cases, but instillation of Lipiodol® is indicated only when the diagnosis remains in doubt. Prompt response to epinephrine or an antihistaminic drug is strongly indicative of allergic reaction as a cause for the symptoms.[2, 6, 10, 12]

Differential diagnosis should not prove difficult in most cases of intermittent, painless parotid swelling of allergic origin, but iodine medication may be overlooked as a causative agent. Although the swelling may be the result of low-grade infection, in such cases pain and purulent secretions usually develop during the course of the disease. Mumps should offer no problem in differentiation, although a recurrent type of swelling associated with low-grade fever and lymphocytosis is reported in children.[1] Tumors, calculi and Mikulicz's disease secondary to sarcoid, lymphomata, etc., are distinguishable by characteristic findings. Cases of recurrent parotitis with no determinable cause have been reported,[4, 7] and it is conceivable that they might have been explained on a basis of allergic reaction had attention been drawn to the possibility.

Treatment of allergic parotitis consists principally of desensitization with specific allergens as determined by skin testing and substantiated by a careful history of allergic reactions. Significant foods should be eliminated from the diet whether the evidence of their culpability arises from the history or from the skin tests. Antihistaminics appear to be of non-specific, symptomatic value. The use of iodides for concurrent asthma is not advisable.

CASE REPORTS

Case 1: A 49-year-old woman, the wife of a physician, was first observed by the author in May 1942. At that time she had had migraine for 15 years and angioneurotic edema and hay fever from which she had been free for five or six years. Since the fall of 1941, she had had bronchial asthma almost continuously. Associated with it were sneezing, stuffiness of the nose and itching of the ears. The patient noted that the symptoms subsided when she left her home in the San Fernando Valley and visited Los Angeles. One week previously, after years of relief, a combination of urticaria and angioneurotic edema involving the entire body developed suddenly. The condition lasted three days and subsided spontaneously.

There were no other significant symptoms except that, although the patient had no food dislikes, she had abdominal cramps and diarrhea whenever she ate peaches. She also noted that certain toothpastes caused her lips to swell. Her mother, father, three siblings and two children all had hay fever. There were no animals about the house and she used feather pillows.

Physical examination showed the nasal mucous membrane to be pale and edematous, the turbinates hypertrophied. Airspaces were ample and there was little discharge. No polypi were observed. The chest was clear except for occasional faint wheeze on expiration. No other abnormalities were noted. Complete tests disclosed pronounced reactions to significant pollens, epidermal materials, and foods. Treated perenially with alternating spring and fall pollens, advised as to environmental control and given a list of foods to eliminate from the diet, the patient since has been free of asthma and only rarely has mild, evanescent rhinitis and urticaria.

In 1946, swelling in the right parotid region developed suddenly while the patient was eating lunch. This subsided in three hours. Since then, the swelling has recurred four to five times a week, usually during or immediately after meals, especially breakfast. Associated with it is an odd stiff sensation of the cheek but no pain. Occasionally the right ear becomes plugged as well. The patient found that massaging the parotid area increases the swelling. Occasional sudden relief has occurred, accompanied by a spurt of saliva into the mouth. By careful observation, the patient has incrim-

---

Presented before the Section on Allergy at the 78th Annual Meeting of the California Medical Association, May 8-11, 1949, Los Angeles.

inated eggs and spices, especially pimientos and green peppers, as causing the swelling, but elimination of these foods from the diet has not reduced the episodes significantly. The parotid ducts have been probed and x-ray studies made but there were no untoward findings in either instance. The patient herself has found that an antihistaminic will cause the swelling to subside almost immediately. Recently, the most severe attack occurred when she opened an old trunk filled with clothes. Since the history of parotid swelling was first obtained, the gland has been examined and found both palpable and visibly swollen. Smears of secretions from Stensen's duct have shown only occasional epithelial cells but never eosinophils. The patient is practically free of the other symptoms of allergic disease, but the parotid swellings continue.

* * *

CASE 2: The patient, aged 52, wife of a physician, was first observed by the author April 27, 1948, because of asthma and bilateral swelling of the face. Fourteen years before, urticaria and angioneurotic edema had begun, with massive swelling of the lips, lids, and external genitalia, and no specific cause could be found. At the same time, perennial asthma and nasal blockage with rhinorrhea developed.

Parotid swelling on both sides had begun in 1947. This was usually sudden in onset and was associated with an increase in saliva and a pulling at the angles of the jaws, which interfered with eating. Except for dull aching, there was no pain. such episodes lasted a few hours to a few days, then subsided slowly. The attacks followed one another with increasing frequency until the patient was rarely free of symptoms. Wheezing had been noted as each episode developed. There were no symptoms relative to the gastrointestinal tract and the attacks of parotid swelling were not associated with season or location. The patient suspected that one attack was caused by the ingestion of crab, and she had also observed that the asthma was worse when she was at her beach home where many cattle grazed.

The past history, except for two operations on the sinuses, had no bearing on the complaints. A son has urticaria and a morning cough. The patient disliked peanut butter but ate all other foods. She slept on pillows with allergen-proof casings, but kept a dog and had wool rugs and ozite pads in the bedroom.

Upon physical examination the patient was observed to be alert and well nourished. The face was quite round, due to swelling over the rami of both mandibles. The parotid glands were large, soft and non-tender. The ducts could not be felt but saliva could be expressed with ease by external pressure. The nasal mucous membrane was pale and edematous, the turbinates large but airways adequate. Nasal secretion was abundant and clear mucoid in character. No abnormalities were noted in the remainder of the examination. Examination of the parotid secretions initially showed many leukocytes, of which 75 per cent were eosinophils. The saliva, however, was not grossly purulent. X-ray films of the parotid areas showed no evidence of calculi. In several subsequent examinations of the parotid secretion, eosinophilia was not again present.

The patient was skin-tested, and very large intradermal wheals developed as reaction to many but not selective pollens, epidermal materials, and foods.

In considering therapy, it was necessary to study the pattern of both the asthma and the parotitis. While the seasonal component was lacking, it was felt because of the skin reactions that pollens probably played a part important enough to warrant treatment. The character of the asthma suggested an environmental etiologic factor. Clinically, the parotitis did not show clear-cut relation to foods and there was every reason to believe that inhalant factors were important. The food reactions, however, could not be disregarded and the suspect items were accordingly eliminated from the diet. Antigens for pollen and epidermal materials were used, and environmental control was effected. Although admittedly complex, the treatment was decided upon as a result of deduction from facts. Treatment was begun in the middle of May. A letter from the patient's husband early in June reported that the asthma, while evident, was not so severe as to necessitate the use of epinephrin, and the parotid swelling had disappeared entirely. The letter emphasized the enormous psychological "lift" which the patient had experienced. Regular letters have reported satisfactory progress, with subsidence of the asthma and absence of parotid swelling except for four episodes all controlled by either pseudo-ephedrine or an antihistaminic. It is interesting that the most recent episode of parotid swelling, the first in several months, developed while the patient was preparing a dish of cracked crab, even though she wore rubber gloves as a precaution. At last report the patient remained well under continued treatment as outlined.

SUMMARY

Two cases of recurrent parotid swelling of allergic nature have been presented and the literature on this subject reviewed.

672 South Westlake Avenue.

REFERENCES

1. Bigler, J. A.: Recurrent parotitis, Med. Clin. N. Amer., 30:97, Jan. 1946.

2. Burton-Fanning, F. W.: Periodic swelling of the salivary glands, Brit. Med. Jour., 2:517, Sept. 19, 1925.

3. Johnston, C. R. K.: Allergy of the salivary glands, Cleveland Clinic Quarterly, 14:55, Jan. 1947.

4. Londe, S., and Pelz, M. D.: Chronic sialodocho-parotitis with recurrent subacute exacerbation, Jour. Pediatrics, 2: 594, May 1933.

5. McCaskey, C. H.: Chronic, non-specific, recurring parotitis, Trans. Am. Lar., Rhin. & Otol., p. 56, June 1942.

6. Meyer, H. S.: Chronic sialodochitis, Jour. Pediatrics, 4:248, Feb. 1934.

7. New, G. B., and Harper, F. R.: Chronic inflammation of the salivary glands with or without calculi, Surg., Gyn. & Obs., 53:456, Oct. 1941.

8. Pearson, R. S. Bruce: Two cases of recurrent swelling of the parotids, Guy's Hospital Reports, 86:333, 1936.

9. Pearson, R. S. Bruce: Recurrent swelling of the parotid glands, Arch. Dis. Child., 10:363, Oct. 1935.

10. Sein, M.: Recurrent swelling of the parotid glands with report of a case, Indian Med. Gaz., 72:526, Sept. 1937.

11. Waldbott, G. L., and Shea, J. J.: Allergic parotitis, Jour. Allergy, 18:51, Jan. 1947.

12. Zindler, G. A., and Frazer, R. H.: Allergic parotid swelling, Jour. Mich. State Med. Soc., 47:863, Aug. 1948.

California
MEDICINE

OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8 PHONE DOUGLAS 2-0062

Editor, DWIGHT L. WILBUR, M.D. *Assistant to the Editor,* ROBERT F. EDWARDS
Editorial Executive Committee
ALBERT J. SCHOLL, M.D., Los Angeles H. J. TEMPLETON, M.D., Oakland
EDGAR WAYBURN, M.D., San Francisco

For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIALS

Catastrophe Coverage

One criticism which proponents of socialized medicine have leveled at voluntary programs of sickness cost insurance has been that the long-term chronic diseases are not covered, that the member suffering from a condition which by its very nature is bound to last a long time cannot receive care for the disease under the voluntary plans.

Voluntary sickness cost insurance is a relatively new member of the insurance family in the United States and, from all indications, a lusty, growing child. Both the physician-sponsored and the medical association non-profit plans have undergone a tremendous growth within a space of only a few years. As witness, our own California Physicians' Service has grown from 125,000 to more than 900,000 beneficiary members in less than five years.

With the growth in membership, C.P.S. and other voluntary plans are in a position to delve into new and unexplored types of coverage, their ability to do so springing from the fact that their financial position is secure to the point where a potential loss from a new type of service may be absorbed by the regular program. In this way a number of innovations have been developed, founded on actuarial experience and offered on an economically indicated basis which has later proved to be accurate in the light of experience. Such progress furnishes additional actuarial material as a basis for still further advances.

Latest item in this progressive movement is the announcement by California Physicians' Service of the addition of catastrophe coverage to its group contracts. For a small addition to the regular monthly dues, C.P.S. is now offering medical and surgical care for a list of 23 diseases or conditions for a period of a full two years or to a maximum expenditure of $5,000, whichever is reached first. The diseases covered are cancer, poliomyelitis, rheumatic fever, diabetes, osteomyelitis, tuberculosis and others in the chronic disease classification. The conditions include severe fractures and severe burns.

Here is pioneering at its best. C.P.S. does not know what the cost of this offering will be; however, it believes it knows this cost closely enough to warrant offering this new coverage to its members. If the advance calculations prove to be wrong, changes will have to be made; on the other hand, if the program can more than carry itself financially, it will be possible to add to it in service or to reduce the dues paid for it. Thus the beneficiary members stand to gain in service if experience proves the accuracy of the advance actuarial calculations; they will not be called upon to underwrite a deficit if the cost of care turns out to exceed the dues paid during the trial period.

California Physicians' Service has already been showered with nationwide acclaim for taking this momentous forward step. Its experience will be closely watched and its program will certainly set a pattern for all voluntary programs. Congratulations to those who studied the possibilities of catastrophe coverage, who worked out the methods of providing the coverage and who had the courage to introduce this latest advance in the voluntary systems of sickness cost insurance.

Industrial Fees for 1950

California physicians have been discussing—and cussing—for a number of months the fact that no established fee schedule was available to cover industrial accident cases. The 1946 fee schedule expired, by order of the Industrial Accident Commission, on June 30, 1949. The California Medical Association's proposed 1949 schedule was not commonly accepted by the bulk of the compensation insurance carriers, and physicians were left in the position of filing claims for their services in practically all cases.

The presentation of a new proposed fee schedule to the Industrial Accident Commission in December 1949 met with no success. The claims filed with the Commission were slow in being heard and relatively few in number, so that the vast majority of physicians were in a position of issuing bills at one level and receiving collections at a lower level. Naturally, a chaotic condition prevailed.

Meanwhile, representatives of the C.M.A. and of the insurance carriers were essentially in agreement on the level of fees which should be made effective for 1950. A further presentation was made to the Industrial Accident Commission, which on February 8 approved the new schedule as a "rule of court" to apply in cases which may come before the Commission. This is as far as the legal powers of the Commission extend; it is also as far as could be expected, which is far enough to make the schedule commonly accepted by both physicians and insurance carriers.

At long last, a new 1950 industrial fee schedule is a fact. As it is recognized by the Association, by the compensation insurance carriers and by the Industrial Accident Commission, there seems no reason to believe it will not be universally applied by all parties.

The new schedule is not perfect. It does not represent all that the Association wanted or asked. It does not meet the requirements claimed by some medical specialty groups and some geographical medical groups. On the other hand, it recognizes a level of fees which will mean substantially higher fees in close to 90 per cent of all industrial accident cases and some increase in the remainder.

Beyond that, the new 1950 fee schedule is based upon an arrangement with the compensation insurance carriers under which continuing meetings will be held between representatives of the C.M.A. and of the carriers. The joint committees which will henceforth be in existence will study all aspects of the compensation medical care field and will arrange for periodical reviews of the fee schedule. Thus, in a friendly atmosphere, inequities in the newly-adopted schedule may be corrected and alleged abuses may be investigated and settled. For the first time in the 37-year history of compensation insurance in California, machinery has been provided to keep industrial medical care under continuous study and scrutiny.

The new fees, by and large, are a most satisfactory advance over the former fees. The working relationship between physicians and insurance carriers is a milestone on the way to better conditions throughout the entire field.

CALIFORNIA MEDICAL ASSOCIATION

R. STANLEY KNEESHAW, M.D. President
DONALD CASS, M.D. President-Elect
LEWIS A. ALESEN, M.D. Speaker
DONALD A. CHARNOCK, M.D. Vice-Speaker
SIDNEY J. SHIPMAN, M.D. Council Chairman
L. HENRY GARLAND, M.D. Secretary-Treasurer
H. GORDON MacLEAN, M.D. Chairman, Executive Committee
DWIGHT L. WILBUR, M.D. Editor
JOHN HUNTON, Executive Secretary General Office, 450 Sutter Street, San Francisco 8
ED CLANCY, Field Secretary Southern California Office, 417 South Hill Street, Los Angeles 13. Phone: MAdison 8863

C.M.A. Statement of Principles

ON THE MEDICAL AND HOSPITAL CARE OF INDIGENTS BY COUNTIES

The following statement was adopted by the Council of the California Medical Association at its regular meeting January 14, 1950.

STATEMENT OF FACTS

1. The residents of counties in California are morally and legally obligated to provide medical care and hospitalization for those persons residing in the county who are unable to secure such care through their own resources.

2. To provide such service, it has been the custom of the counties, with few exceptions, to maintain a county hospital, in which are located beds for the care of the indigent sick, surgical facilities for those who need them and, in many instances, clinic facilities for the care of ambulatory patients.

3. It has also been the custom of most counties to provide both hospital bed and clinic facilities on the basis of maximum demand; such facilities are often not in use because the morbidity rate is below the maximum anticipated.

4. The provision of maximum demand facilities has not constituted a financial strain on the counties until recent years, when construction costs have risen materially. Inasmuch as the counties are legally required to keep their bonded indebtedness within a fixed maximum, the provision of additional hospital and clinic facilities at this time represents an extremely difficult financial operation, often impossible.

5. At the 1949 session of the State Legislature, A.B. 916 was enacted as Section 202 of the Welfare & Institutions Code. This law provides that the counties may contract with private individuals and institutions for the medical and hospital care of those indigents who are legally entitled to be given such care at the expense of the counties. This law makes it possible for the county governments to utilize the facilities of private hospitals and private medical care facilities (doctors' offices) in caring for eligible indigents and thus save (a) capital investments in facilities and (b) prolonged expensive hospital sojourns.

6. There exist in California today some 271 private hospitals with 48,829 beds for sick patients, many of these institutions having clinic facilities for the care of ambulatory patients. There also exist some 12,000 offices of private physicians capable of and licensed to treat ambulatory patients.

7. There exists in California today an organization of more than 10,000 physician members, California Physicians' Service, capable of contracting with county governments for the out-patient medical care of county indigents.

8. There exist in California today two hospitalization organizations, Hospital Service of California and Hospital Service of Southern California, both being non-profit organizations of hospitals capable of contracting with county governments for hospital care of county indigents.

CONCLUSIONS

1. Present construction costs make unwise the building of more county hospital facilities, either beds or clinic quarters, at this time unless urgently needed. Construction is only the beginning—maintenance goes on forever.

2. The maintenance of large county hospital facilities is a continuous financial drain on taxpayers.

3. The cost of operating county hospitals, including the maintenance of maximum facilities, is considerably higher than the comparable cost of private hospitals per patient per day.

4. The cost of operating county hospital clinic or out-patient facilities, including the maintenance of maximum facilities, makes for a high per-patient cost for the care provided.

PRINCIPLES

1. Additional county hospital construction in California, except for possible additional beds for the acute sick, is not needed at this time.

2. The counties should avail themselves of the provisions of Welfare & Institutions Code, Section 202, in contracting for the care of their indigent charges.

3. The facilities of the two hospitalization organizations and of California Physicians' Service should be utilized to the full by the counties in contracting for hospital and medical care for their eligible indigents.

4. The counties must retain the obligation of providing a social service screening of county residents for the determination of eligibility to receive these contracted services.

5. The counties should carefully survey the available medical and hospital care facilities within their own borders prior to seeking state or federal funds or incurring additional bonded indebtedness for added hospital construction.

Council Meeting Minutes

367th Meeting

Tentative Draft: Minutes of the 367th Meeting of the Council, Los Angeles, January 14, 1950.

The meeting was called to order by Chairman Shipman in Conference Room No. 8 of the Biltmore Hotel, Los Angeles, at 9:30 a.m., Saturday, January 14, 1950.

Roll Call:

Present were President Kneeshaw, President-elect Cass, Speaker Alesen, Vice-Speaker Charnock, Councilors Shipman, MacLean, Ball, Crane, Henderson, Anderson, Ray, Montgomery, Lum, Pollock, Green, Bailey, West, Frees and Thompson, and Editor Wilbur.

Absent for cause: Secretary-Treasurer Garland.

A quorum present and acting.

Present by invitation were Executive Secretary Hunton, Assistant Executive Secretary Wheeler, Legal Counsel Hassard, Field Secretary Clancy, Messrs. Clem Whitaker, Jr., and Ned Burman of public relations counsel, Dr. Wilton L. Halverson, State Director of Public Health, county society executive secretaries S. K. Cochems of Los Angeles, Glenn Gillette of Fresno, Vance Venables of Kern, K. C. Young of San Diego and William O. Tobitt of Orange; Dr. Lowell S. Goin, president, and Mr. William M. Bowman, executive director of California Physicians' Service; Drs. E. Vincent Askey, J. Lafe Ludwig, Louis Regan, John Ruddock, Eugene Hoffman, Sam J. McClendon and Clarence Rees; Mr. Ritz Heerman.

1. *Minutes:*

(a) On motion duly made and seconded, minutes of the 366th meeting of the Council, held November 20, 1949, were approved.

(b) On motion duly made and seconded, minutes of the 217th meeting of the Executive Committee, held December 14, 1949, were approved.

(c) On motion duly made and seconded, minutes of the 218th meeting of the Executive Committee, held December 22, 1949, were approved.

2. *Membership:*

(a) A report of membership as of January 13, 1950, was received and ordered filed.

(b) On motion duly made and seconded, five members whose 1949 dues had been received since the last Council meeting were voted reinstatement.

(c) On motion duly made and seconded in each instance, six applicants were elected as Associate Members. These were:

Alameda County: Melvin B. Black, Catharine Eastman, Benjamin A. Kogan, Reinhard B. Lewis.

San Francisco County: Irene A. Heindl, Lloyd E. Wilson.

(d) On motion duly made and seconded in each instance, seven applicants were elected to Life Membership. These were: Howard R. Parker, Alameda County; Lloyd Mills, Los Angeles County; L. B. Barnes, Placer-Nevada-Sierra County; R. R. Root, Riverside County; Burt F. Howard and Charles I. Titus, Sacramento County; and J. M. O'Donnell, San Benito County.

(e) On motion duly made and seconded in each instance, ten applicants were elected to Retired Membership. These were: Harry Auslen and Frank W. Redmonds, Alameda County; John W. Bumgarner and George W. Sweetser, Contra Costa County; George Berger, John W. Robinson and Raymond G. Taylor, Los Angeles County; Eleanor B. Rodgerson, Sacramento County; Lyman Elanson Thayer, San Bernardino County; Elmer J. Chesbro, Santa Clara County.

(f) On motion duly made and seconded in each instance, eleven applicants were granted a reduction of dues because of illness or postgraduate study.

3. *Financial:*

(a) A report showing bank balances and other items as of January 13, 1950, was received and ordered filed.

(b) On motion duly made and seconded, an appropriation of $5,000 originally made in 1948 to the Committee on Medical Economics, and not expended, was reaffirmed as applicable to the 1949-1950 fiscal year.

4. *Industrial Fee Schedule:*

President Kneeshaw summarized the meetings and other actions leading up to the adoption by the Executive Committee of a new schedule of fees for industrial accident cases and there was general discussion. The proposed new schedule has been approved by representatives of insurance carriers and has been presented to the Industrial Accident Commission for approval.

After considerable discussion, it was regularly moved, seconded and voted that the decision and actions of the Executive Committee be ratified by the Council, with the understanding that no fees in the new schedule be at levels lower than those in the 1946 schedule adopted by the Industrial Accident Commission.

Doctors Pollock and Thompson voted in the negative.

The Chairman called attention to the fact that a permanent committee is to be appointed to meet with a similar committee from the insurance carriers. He stressed the importance of a careful selection of the membership of this committee and asked all members of the Council to consider this matter and be prepared at the next meeting to present nominations.

5. *California Physicians' Service:*

Dr. Lowell S. Goin, president of California Physicians' Service, reported on the establishment of a new committee in C.P.S., composed of chairmen of standing committees and meeting the day before board of trustees meetings; this has resulted in increased efficiency in board actions. He also reported that as of December 31, 1949, C.P.S. has approximately 875,000 beneficiary members and 10,326 physician members. Dr. Goin stated that under new legislation C.P.S. can deal directly with boards of supervisors for the ambulatory care of county indigents and that 16 county medical societies have shown an interest in establishing such a system; C.P.S. prefers that the county societies initiate interest and action in such instances.

Dr. Goin reported that C.P.S. is now negotiating with the Veterans Administration for an increase in the fees allowed for office and home visits. He also stated that C.P.S. is now considering the issuance of catastrophic contracts, to provide two years of care for a list of some 30 diseases or conditions. This would be issued as a rider to existing contracts.

Mr. Bowman discussed the balance sheet of California Physicians' Service as of November 30, 1949, and the operating statement for the eight months ended November 30, 1949. He pointed to the administrative cost for that period of 12.9 per cent, compared with an average of 13.29 per cent for the 15 prepayment plans of 200,000 or more enrollment, the largest of which had an administrative cost in excess of 20 per cent.

Dr. Goin summarized the report made by business analysts of the C.P.S. operations, the report showing notable improvement since an earlier study made in 1946-1947 and pointing to better operating conditions and an earnest endeavor by C.P.S. to follow sound business principles.

6. *National Cancer Institute:*

Dr. Goin discussed the manner in which federal funds for cancer research, teaching and control are distributed and pointed to the merits and dangers in the present method of allocation. Dr. Halverson explained that the $162,000 in such funds available in California is spent in conformity with plans worked out between the State Department of Public Health and the Association's Cancer Commission.

7. *State Department of Public Health:*

Dr. Halverson discussed the public health problems created by the presence of large numbers of migrant workers in the San Joaquin Valley, pointed to the high infant mortality rate in this group and stated that 26 per cent of the state's infant deaths occurred in a group of valley counties. His department plans a fly eradication program in controlled areas next summer as a means of determining if infant diarrhea may be minimized; he asked that the Association offer other suggestions. A letter from Councilor Anderson along these lines was referred to the Committee on Public Health and Public Agencies.

8. *Fees for Polio Cases:*

The question of payments to physicians for services in polio cases, where the National Foundation for Poliomyelitis assumes the cost of care, was discussed and it was regularly moved, seconded and voted to refer this to the Committee on Public Health and Public Agencies.

9. *Vocational Rehabilitation:*

A letter from Dr. Herbert I. Notkin, medical consultant to the Bureau of Vocational Rehabilitation of the State Department of Education, was read, the letter stating that the social servicing of applicants prior to the initial physical examination would represent a change in the bureau's policy and that the matter would be presented to the Medical Advisory Board of the bureau for consideration.

10. *Committee on Public Health and Public Agencies:*

Dr. Alesen gave a progress report and stated that legislation was being prepared to define more accurately the scope of activities of laboratory technicians and technologists. He also reported on a recent meeting with a committee from the California Conference of Local Health Officers, at which progress was made in arriving at acceptable definitions of the scope of activities of health centers and the practice of public health.

11. *Voluntary Health Insurance:*

Messrs. Eugene Robison, Gilbert Smith and Clarence Tookey appeared before the Council to request the cooperation of the Association in working out a fee schedule which could be considered a total fee for services provided to holders of commercial insurance policies below an accepted income ceiling. Dr. Ray reported on a meeting with insurance representatives in San Francisco along the same lines and it was agreed the special committee consisting of Doctors Lum, Ray and Ball should continue a study of the various proposals.

12. *American Public Health Association:*

Dr. Louis Regan reported on the recent annual meeting of the American Public Health Association, called attention to the organizational setup of this association and urged that members of the Association take a greater interest in the A.P.H.A.

13. *Academy of Forensic Sciences:*

Mr. Hassard called attention to the organization meeting of the Academy of Forensic Sciences, a national body interested in the replacement of the coroner system with a medical examiner system. On motion duly made and seconded, it was voted to appoint Dr. Louis Regan as the C.M.A. delegate to this meeting, to be held in Chicago, provided the Los Angeles County Medical Association will grant him the time to attend the session.

14. *Committee on Interns and Residents:*

Dr. J. Lafe Ludwig, chairman of the Committee on Interns and Residents, presented a report which advocated the publication of a bimonthly brochure to be sent to medical students, interns and residents, at an estimated cost of about $3,000 annually. On motion duly made and seconded, this report was approved and the estimated funds appropriated for this purpose.

15. *Committee on Postgraduate Activities:*

Dr. John Ruddock, chairman of the Committee on Postgraduate Activities, announced the resignation of Dr. Carroll B. Andrews as director of the committee's program. On motion duly made and seconded, this resignation was accepted with regret and with an expression of appreciation for the valuable services rendered by Dr. Andrews; the date of resignation is February 1, 1950.

Dr. Ruddock proposed the appointment of Dr. Charles A. Broaddus of Stockton to succeed Dr. Andrews, appointment to be on the basis of half-time at a compensation of $500 monthly. On motion duly made and seconded, this appointment was voted.

Dr. Ruddock also requested that clerical help be secured for Dr. Broaddus on a full- or half-time basis and on motion duly made and seconded, such employment was approved.

Dr. Ruddock announced that the program of his committee would be aimed at providing postgraduate opportunities for all members of the Association, in urban as well as rural areas.

16. *Weimar Sanitarium:*

The report of a special committee to review the medical care program of Weimar Sanitarium was considered and on motion duly made and seconded, it was voted to approve this report and to forward a copy to the board of supervisors in each county which participates in the operation of the institution.

17. *Committee on Medical Education and Medical Institutions:*

A report of the committee, recommending against the approval of Association members serving as faculty members in a proposed school for drugless practitioners, was read and discussed. On motion duly made and seconded, the report was approved.

18. *Nursing:*

Dr. Kneeshaw reported on a meeting held with representatives of the California State Nurses Association at which matters of mutual interest had been discussed. He recommended that a committee be appointed to meet with a similar committee of the C.S.N.A. when similar matters occur and on motion duly made and seconded, it was voted that the Chairman appoint such a committee.

A statement of the Association's attitude on nursing, ordered by the Executive Committee, was read and discussed. It was agreed that copies of this statement be sent to all members of the Council for consideration prior to the next meeting.

19. *Legal Department:*

Mr. Hassard discussed several developments in medicolegal considerations, including a recent decision by the California Supreme Court holding that expert opinion is required in technical professional liability proceedings and that common knowledge is not sufficient in such cases. He also suggested that the California delegates to the American Medical Association take steps to bring about the creation of a department within the A.M.A. which could analyze and advise in advance on proposed federal appropriations for medical services. He also discussed the import of the new lobbying law adopted by the 1949 special session of the Legislature.

20. *Public Relations:*

Clem Whitaker, Jr., reported that the Association's radio program, "California Caravan," has reached a new high listener rating. He also stated that a press conference recently held by a physician who had just returned from Europe had been most successful and urged that other physicians who have had an opportunity to study state medicine first-hand plan to hold similar press conferences.

21. *Public Policy and Legislation:*

Dr. Cass reported on a meeting held in Denver on January 7, attended by representatives of 21 western state medical associations, at which several resolutions were adopted relative to pending federal legislation. On motion duly made and seconded, it was voted to prepare a resolution for California delegates to introduce in the A.M.A. House of Delegates to provide for the strengthening of the Washington office of the A.M.A.

22. *California State Board of Nurse Examiners:*

A request from the California State Board of Nurse Examiners, for the nomination of two candidates for the appointment of one as a member of an advisory board, was read. It was regularly moved, seconded and voted that the Chairman make two nominations.

23. *A.M.A. Industrial Health Conference:*

An invitation to attend an industrial health conference scheduled by the American Medical Association was discussed and it was regularly moved, seconded and voted that Dr. C. Kelly Canelo be sent as an official delegate to this meeting.

24. *Los Angeles Anatomical Institute:*

An application of the Los Angeles Anatomical Institute for approval by the Association was discussed and it was regularly moved, seconded and voted to refer it to the Executive Committee.

25. *Student Nurse Recruitment Program:*

On motion duly made and seconded, it was voted that the Chairman appoint a representative to serve on a committee of nursing, nursing school and hospital representatives.

26. *Santa Clara County Medical Society:*

A request for financial participation in a public relations campaign of the Santa Clara County Medical Society was discussed and on motion duly made and seconded, it was voted to postpone action on this matter to the next meeting.

27. *Time and Place of Next Meeting:*

The next meeting will be held in San Francisco on Sunday, March 19, 1950, following the March 18 Conference of County Medical Society Secretaries.

Adjournment.

There being no further business to come before the meeting, it was adjourned at 6:20 p.m.

Sidney J. Shipman, M.D., *Chairman*
L. Henry Garland, M.D., *Secretary*

Executive Committee Minutes

217th Meeting

Tentative Draft: Minutes of the 217th Meeting of the Executive Committee, San Francisco, December 14, 1949.

The meeting was called to order by Chairman MacLean in Room 218 of the St. Francis Hotel, San Francisco, at 6:30 p.m., Wednesday, December 14, 1949.

Roll Call:

Present were President Kneeshaw, Council Chairman Shipman, Auditing Committee Chairman MacLean, Secretary Garland and Editor Wilbur. A quorum present and acting.

Present by request were Executive Secretary Hunton and Legal Counsel Hassard. Present by invitation were Drs. Frank J. Cox, Victor Dillon and A. B. Sirbu, representing the Western Orthopedic Association; Avery Hicks, representing ophthalmology; Ralph Teall, president of the Sacramento Society for Medical Improvement; Wayne Pollock, Councilor of the Eighth District; M. L. Skaggs and William B. Neff, anesthesiologists.

1. *Industrial Medical and Surgical Fees:*

Mr. Hassard was asked to review the history of medical and surgical fees for industrial injury cases and discussed the basis on which such fees had been established since the first fee schedule was adopted in 1913. Thereafter there was discussion on the schedule of fees arrived at by compromise between the subcommittee of the Executive Committee (Drs. Kneeshaw, Cass and Garland) and representatives of the compensation insurance underwriters. Objections to the approval of such a schedule or its offer to the Industrial Accident Commission for approval were voiced by the orthopedists and by the Sacramento Society for Medical Improvement. Both asked that a longer time be allowed for a more thorough study of the schedule by their groups. Dr. Hicks voiced disapproval of two specific items in the proposed schedule and Drs. Skaggs and Neff asked that certain changes be made in the schedule items affecting anesthesiology.

2. *Executive Session:*

At this point the Executive Committee went into executive session, at which time it was agreed that the subcommittee which had dealt with the insurance representatives had had authority to act, that it had acted in good faith and that good faith demanded the presentation of the schedule to the Industrial Accident Commission for approval. It was further agreed that Dr. Kneeshaw should present the schedule to the Industrial Accident Commission at its meeting of December 15, 1949.

Adjournment.

There being no further business to come before the committee, the meeting was adjourned at 12:05 a.m., December 15, 1949.

H. Gordon MacLean, M.D., *Chairman*
L. Henry Garland, M.D., *Secretary*

218th Meeting

Tentative Draft: Minutes of the 218th Meeting of the Executive Committee, San Francisco, December 22, 1949.

The meeting was called to order by Chairman MacLean in Room 212 of the St. Francis Hotel, San Francisco, at 2:00 p.m., Thursday, December 22, 1949.

Roll Call:

Present were President Kneeshaw, Speaker Alesen, Council Chairman Shipman, Auditing Committee Chairman MacLean and Secretary Garland. A quorum present and acting.

Present by request were Executive Secretary Hunton, Legal Counsel Hassard and Assistant Executive Secretary Wheeler.

1. *Industrial Medical Fees:*

A general discussion of the industrial medical fee situation was held and it was agreed that a letter be sent to the chairman of the insurance negotiating committee, outlining the basis of the proposed 1950 fee schedule.

On motion duly made and seconded, it was voted to send a copy of the 1950 fee schedule to secretaries of the county medical societies and to each member of the Association, with an appropriate foreword of explanation, such mailing to be made at the earliest practicable date. The Executive Secretary was instructed to send copies of the proposed foreword to all members of the Executive Committee for approval.

2. *Local Health Officers:*

On motion duly made and seconded, it was voted to notify the Committee on Public Health and Public Agencies that the Executive Committee considered it advisable to name one local health officer to each of the subcommittees of the main committee.

On motion duly made and seconded, it was voted to send a communication to the county medical societies to suggest that local health officers be invited to attend meetings of the county societies' councils, especially when matters relating to public health activities were to be subjects of discussion.

3. *Committee on Public Health and Public Agencies:*

It was agreed that a member of the standing Committee on Hospitals, Dispensaries and Clinics be added to the special Committee on Hospital Construction (Drs. Thompson and Anderson, Mr. Hassard) and Chairman Alesen of the Committee on Public Health and Public Agencies announced his intention to invite Dr. John C. Sharp of Salinas to accept such appointment.

4. *Secretarial Conference:*

After discussion it was agreed that the annual Secretarial Conference should be held in San Francisco on March 18, 1950, with the expectation that the Council would meet the following day. It was suggested that one or more county society executive secretaries be invited to discuss their county programs at this meeting.

5. *C.M.A. Mailing List:*

On motion duly made and seconded, it was voted to permit the California Academy of Sciences and the Department of Research and Statistics of the Industrial Accident Commission to use the Association's mailing list for approved literature.

6. *Payments for Poliomyelitis Care:*

Discussion was held as to the propriety of physicians accepting payments from national organizations for their care of poliomyelitis cases of nonindigent patients and it was agreed to discuss this matter further at the next Council meeting.

7. *Legal Department:*

Mr. Hassard reported on several legal matters, including the California Supreme Court decision in favor of a physician in a malpractice suit, the prosecution of anti-trust suits against two medical associations and the passage of new legislation by the special session of the State Legislature.

On motion duly made and seconded, it was voted to prepare a statement on the Association's attitude toward the practice of nursing, to be sent to the county medical societies and to members of the Legislature. Dr. Kneeshaw and Messrs. Hassard and Hunton were instructed to prepare such a statement for the approval of the Executive Committee.

On motion duly made and seconded, it was voted that a documented article be prepared for prominent publication in CALIFORNIA MEDICINE relative to health insurance and the interest of some public officials in it, such article to be reviewed before publication by present and former officers of the Association.

On motion duly made and seconded, it was voted to instruct legal counsel to prepare an article for publication in CALIFORNIA MEDICINE to clarify the provisions of the hypnotic drug law adopted by the 1949 Legislature.

On a question of medical ethics relating to a physician associating with a lay laboratory technologist, legal counsel was instructed to investigate the consideration of such matters by the Judicial Council of the American Medical Association.

8. *Care of War Veterans:*

It was regularly moved, seconded and voted to make a suitable announcement in the official Journal of the advisability of ascertaining from veterans any rights they might have under federal laws for private care by physicians and to notify the California Department of the American Legion to that effect.

9. *Employment of Executive Secretary:*

In executive session it was regularly moved, seconded and voted to extend for a period of three years starting May 1, 1950, the employment contract of the Executive Secretary, compensation to be at the present level, with the provision that within the next six months a designated appointee of the Executive Committee review the compensation received by officers performing similar duties with other organizations and businesses, with a view toward possible upward revision of compensation.

10. *Medical Economics:*

Dr. MacLean reported that the Alameda County Medical Association, through the Committee on Medical Economics of the California Medical Association, in its study of physician-patient relationships plans to secure the services of a business psychologist, who would make a study along these lines. The Alameda County Medical Association is underwriting the expense of this study, with the thought that the California Medical Association may wish to share in the contemplated $5,000 cost if the results appear to warrant such an appropriation. This sum has previously been appropriated by the Council for a study of physician-patient relationships which has been under way in the past two years.

11. *Additional Delegate to A.M.A.:*

The Secretary reported that the Association was entitled to eleven (11) Delegates and Alternates to the American Medical Association and that only ten (10) had so far been elected or appointed. The additional Delegate and Alternate would be entitled to serve on January 1 of the year following their election or appointment. On nominations duly made and seconded in each instance, R. Stanley Kneeshaw of San Jose was elected Delegate and Russel V. Lee of Palo Alto was elected Alternate, both to serve for the year 1950. It was pointed out that these offices for the term starting January 1, 1951, would be subject to election by the 1950 House of Delegates.

Adjournment.

There being no further business to come before the meeting, it was adjourned at 6:25 p.m.

H. GORDON MACLEAN, M.D., *Chairman*
L. HENRY GARLAND, M.D., *Secretary*

C.P.S. to Change Contracts and Fees Only Once Yearly

In order to avoid confusion and to permit better evaluation of any changes that are made, California Physicians' Service henceforth will make changes in contracts with beneficiaries and in fee schedules only once each year—at the meeting of the board of trustees on or after September 1. This policy, which was announced recently by Henry L. Gardner, M.D., secretary of C.P.S., in a letter to presidents of all county medical societies, was adopted by the board of trustees at its meeting in January.

"This action was taken," the letter explains, "because changes in the schedule and in our contracts have a very direct effect on our finances. Projections into the future cannot be made with any degree of accuracy without an adequate length of time to evaluate previous changes.

"We believe this will permit time not only for more adequate consideration of the schedule, but for study of the schedule in relation to existing contract rates and benefits for contemplated revision of contracts.

"Furthermore, we realize that changes are confusing to physician and beneficiary members alike, and making all necessary revisions at one specific time should make for smoother relationships.

"The Fee Schedule Committee functions on a continuing basis, and will continue to welcome suggestions from physician members. Their report will continue to be made at the annual meeting, but without the necessity for immediate action without due consideration."

In Memoriam

DRAPER, DAVID BURRIS. Died in San Jose, January 17, 1950, aged 55, of a heart attack. Graduate of St. Louis University School of Medicine, 1921. Licensed in California in 1922. Dr. Draper was a member of the Santa Clara County Medical Society, the California Medical Association, and the American Medical Association.

✣

LEWIS, FLOYD D. Died in Concord, January 24, 1950, aged 65, of lymphoblastoma and chronic myocarditis. Graduate of Willamette University Medical Department, Salem, Oregon, 1909. Licensed in California in 1921. Dr. Lewis was an Associate Member of the Alameda County Medical Association, and the California Medical Association.

✣

MICHELSON, PAUL DANIEL, JR. Died in Berkeley, January 1, 1950, aged 56. Graduate of the College of Physicians and Surgeons of San Francisco, 1920. Licensed in California in 1920. Dr. Michelson was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

✣

MORRISON, WAYLAND AUGUSTUS. Died in Los Angeles, January 5, 1950, aged 61. Graduate of Harvard Medical School, Boston, 1914. Licensed in California in 1914. Dr. Morrison was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

PAGE, CLARENCE WINSLOW. Died in Berkeley, January 25, 1950, aged 70, of coronary occlusion. Graduate of Cooper Medical College, San Francisco, 1904. Licensed in California in 1904. Dr. Page was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

YOAKAM, FRANK ARTHUR. Died in Moorpark, January 5, 1950, aged 74, after a long illness. Graduate of the National Medical University, Chicago, 1902. Licensed in California in 1921. Dr. Yoakam was a retired member of the Ventura County Medical Society, and the California Medical Association.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Pamphlets titled "How the Doctors in Alameda County Are Protecting You," describing the **facilities and services of the Alameda County Medical Association,** are being distributed to the public by the association. The pamphlet gives information on how to obtain the services of a qualified physician in an emergency, how to obtain medical care if there is no money to pay the doctor, how to protect the family budget against cost of illness, how to present medical care problems for solution or any complaint for action by the medical association.

A statement by the association accompanying announcement of the pamphlet said: "We want everyone to have the information contained in this booklet because the Alameda County Medical Association **guarantees medical care to all,** regardless of ability to pay, and we want people to know how to obtain this care when needed."

More than 75,000 of the booklets have been distributed through retail druggists who have wrapped them with packages, and by speakers who have handed them out to audiences.

CONTRA COSTA

Voters in the Concord Hospital District defeated a proposed bond issue to provide funds for building a **district hospital** with state and federal aid. Votes against the bonds were reported to have exceeded those for the issue by about 3 to 1. Following defeat of the proposal, it was announced that the board of directors of the Concord Community Hospital, a non-profit organization which is already in operation, will go forward with plans for improvement of existing facilities.

INYO

Dr. Victor H. Hough has been appointed full-time health officer for Inyo County, succeeding **Dr. Charles W. Anderson.** Dr. Hough's headquarters are at Independence.

LAKE

Dr. Selmes P. Funkhauser last month became health officer for Lake County, succeeding **Dr. M. C. Beil.** Dr. Funkhauser's headquarters are at Clearlake Highlands.

LOS ANGELES

The annual **Postgraduate Assembly of the College of Medical Evangelists** will be held on the Los Angeles campus of the medical school March 12, 13 and 14, at Paulson Hall, 1825 Michigan Avenue. More than 1,500 physicians from all over the United States are expected to attend.

Among guest speakers from outside the state are Dr. Jonathan Forman, professor of history of medicine, Ohio State Medical School, who will read a paper, "What About Vitamins?"; Colonel James P. Cooney, Division of Military Application, Washington, D. C., who will speak on "Medical Aspects of Radiological Defense"; Dr. Frank N. Allan, of the Lahey Clinic, Boston, who will discuss "Coma, Its Causes and Treatment"; and Dr. Carl G. Morlock of the Mayo Clinic and assistant professor of medicine, University of Minnesota, whose topic is "Current Concepts in Treatment of Duodenal Ulcer."

Medical professors from the University of California in Los Angeles, the University of Southern California, and other western medical schools, together with specialists and clinicians from the College of Medical Evangelists, will present lectures, panel discussions, scientific exhibits and motion pictures during the session.

SAN FRANCISCO

Dr. Lowell Rantz, associate professor of medicine at Stanford University School of Medicine, was elected president of the Western Society for Medical Research at that organization's third annual meeting in January. Dr. Rantz succeeds **Dr. Myron Prinzmetal** of Los Angeles.

* * *

Two **appointments to the faculty** of the University of California Medical School were announced recently. Dr. Dermott Brownrigg Taylor, formerly of the faculty of the University of London, was appointed associate professor of pharmacology, and Dr. Ralph Hawkins of Mill Valley was appointed lecturer in anatomy.

* * *

Two San Francisco physicians are to make overseas tours this year as participants in the Army Medical Department overseas consultant program, according to announcement last month by the Army Surgeon General. **Dr. Karl M. Bowman** is scheduled to leave July 5 for a tour of the Far East Command, and **Dr. James O. Gillespie** is to visit the European Command area next November.

GENERAL

A plan to cover **medical care costs** over an extended period for 23 diseases which by their nature often require long-continued treatment was announced recently by **California Physicians' Service.** By this action C.P.S. became the first non-profit health plan in the nation to offer coverage for so-called "catastrophic" illnesses.

The new "catastrophic coverage" provides greatly increased medical, surgical and radiological therapy services —up to two years or in the amount of $5,000—for persons with the following diseases: Cancer, tuberculosis, diabetes, poliomyelitis, osteomyelitis, rheumatic fever, brain tumor, congenital heart disease, pernicious anemia, severe fractures, Hodgkin's disease, goiter, hemophilia, Raynaud's disease, cirrhosis of the liver, malaria, undulant fever, coronary artery disease, paralysis, epilepsy, detached retina, severe burns, and leukemia.

Extension of coverage for these conditions at a small cost in monthly dues will be made on a group enrollment basis —either as additional protection for existing C.P.S. groups or as expanded coverage for new groups.

* * *

The board of regents of the **American College of Chest Physicians** has announced the offering of a cash prize award of $250 to be given annually for the best original contribution, preferably by a young investigator, on any phase relating to chest disease. The first award will be made at the forthcoming annual meeting of the College to be held

POSTGRADUATE EDUCATION NOTICES

American College of Physicians

Course: Internal Medicine.

Date: June 19 through 23, 1950.

Fee: A.C.P. members, $30.00; non-members, $60.00.

Contact: Stacy R. Mettier, M.D., F.A.C.P., Director, Medical Extension, University of California Medical Center, San Francisco 22, California.

College of Medical Evangelists, Graduate School of Medicine

Course: Endocrinology (8 periods).

Date: April 3 to May 22, 1950, Mondays 8:00 to 9:30 p.m.

Fee: $30.00.

Course: Thoracic Surgery (8 periods).

Date: May 3 to June 21, 1950, Wednesday 8:00 to 9:30 p.m.

Fee: $30.00.

Contact: H. M. Walton, M.D., Dean, Graduate School of Medicine, College of Medical Evangelists, 312 North Boyle Avenue, Los Angeles 33, California.

University of Southern California, Medical Extension Education

Course: Survey Course for General Practitioners.

Date: March 13, 1950, through March 17, 1950, five days, full-time.

Fee: $50.00.

Place: Los Angeles County Hospital.

Courses in Anesthesia to be arranged. General Review of Clinical Anesthesia; Basic Principles and Techniques. 12 weeks. Tuition $50.00 to $300.00.

University of California, Medical Extension

Course: Graduate Course in Ear, Nose and Throat Pathology.

Date: April 2 through 9.

Fee: $50.00.

Course: Internal Medicine and General Surgery.

Date: April 24 through 28.

Fee: $50.00.

Course: Psychiatry for the General Practitioner.

Date: April 24 through 28.

Fee: $50.00.

Contact: Stacy R. Mettier, M.D., Medical Extension, University of California Medical School, San Francisco 22, California. Fee and printed program supplied on request.

Stanford University School of Medicine

Course: Postgraduate conference in Clinical Ophthalmology, March 27 through March 31, 1950. Registration will be open to physicians who limit their practice to the treatment of diseases of the eye, ear, nose and throat. In order to allow free discussion by members of the conference, registration will be limited to 30 physicians. Instructors will be Drs. A. Edward Maumenee, Dohrman K. Pischel, Jerome W. Bettman, Earle H. McBain and Arthur J. Jampolsky. Programs and further information may be obtained from Office of the Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

---

in San Francisco June 22-25, 1950. Manuscripts submitted for the award must reach the office of the American College of Chest Physicians not later than May 1, 1950.

Additional information may be obtained from the executive secretary of the college, 500 North Dearborn Street, Chicago 10, Illinois.

* * *

Award of two **fellowships for research** in California hospitals was announced recently by the American Heart Association. One went to Joseph H. Miller, Los Angeles, for research on a mechanical heart-lung at Cedars of Lebanon Hospital, and the other to Ray H. Rosenman of Chicago for studies on hypertension at Mount Zion Hospital, San Francisco.

* * *

The national convention of the American Academy of Applied Nutrition and the American Anti-Arthritis Association will be held in Riverside on April 1 and 2, 1950.

* * *

The following resolution was adopted by the **California Society of Pathologists** at its semi-monthly meeting in December:

Resolved, That as a statement of policy the California Society of Pathologists is opposed to the centralization of facilities for the initial diagnosis of malignant disease by means of examinations of tissues, exudates, or bodily excretions by whatever name the procedure might be called. This is specifically meant to include any exfoliative cytologic diagnostic procedure proposed as a part of any mass survey conducted by federal, state or municipal government or political subdivision thereof or by any private organization sponsored or supported by such governmental agency or by endowments or public voluntary subscription; and be it further

Resolved, That exfoliative cytologic examinations incident to mass surveys be done at the local level by pathologists licensed to practice medicine in California. Should the local pathologist desire consultation, in accordance with usual custom, he may refer the material to any pathologist of his choice."

* * *

The California Medical Association has received the following communication from Dr. George F. Lull, secretary and general manager of the American Medical Association:

"On January 9, 1950, an estimate was made of all monies sent in by the various state and territorial medical associations in payment of the 1949 [A.M.A.] **assessment.** This shows that, percentagewise, your society stands Number 4 on the list of 53 constituent associations."

* * *

The Cancer Commission of the California Medical Association announces a **postgraduate (refresher) course on neoplastic diseases** for practicing physicians to be given Thursday and Friday, March 30 and 31, in Lane Hall, San

Francisco. The course will be conducted by Stanford University School of Medicine and University of California Medical School in cooperation with the California division of the American Cancer Society which is defraying the expenses of the course. Enrollment will be limited to 300. Applications should be mailed to Dr. David A. Wood, Secretary, Cancer Commission, California Division of the American Cancer Society, 467 O'Farrell Street, San Francisco 2, California, not later than March 23, 1950. The program for the two days follows:

THURSDAY

Ralph Byron, M.D., Chairman

8:30 a.m.—Introductory Remarks, David A. Wood, M.D., Secretary, Cancer Commission.

8:45 a.m.—Cancer Examination.

9:45 a.m.—Rectum and Colon—Robert A. Scarborough, M.D., and H. Glenn Bell, M.D.

10:30 a.m.—Recess.

10:45 a.m.—Breast—Leonard G. Dobson, M.D., and Robert S. Stone, M.D.

11:30 a.m.—Esophagus and Stomach—Leon Goldman, M.D., and Albert Snell, M.D.

1:45 p.m.—Lung—E. F. Holman, M.D., and H. B. Stephens, M.D.

2:30 p.m.—Lymphoblastoma—Michael Shimkin, M.D., and Warren Bostick, M.D.

3:30 p.m.—Recess.

3:45 p.m.—Chemosurgery—Richard Shepard, M.D.

4:30 p.m.—Stanford Tumor Conference.

FRIDAY

R. R. Newell, M.D., Chairman

9:00 a.m.—Uterus, Cervix and Corpus—Daniel Morton, M.D., and L. Henry Garland, M.D.

10:00 a.m.—Panel—Two Major Symptoms of Carcinoma—Bleeding and Cough—Norman Sweet, M.D., and Victor Richards, M.D.

11:15 a.m.—Visible Tumors — Glenn Bell, M.D., Frances Torrey, M.D., and Bertram Low-Beer, M.D.

2:00 p.m.—Experimental Advances in Diagnosis and Therapy of Cancer—Philip West, M.D., and Howard Bierman, M.D.

* * *

BOOK REVIEWS

ALLERGY IN RELATION TO OTOLARYNGOLOGY. By French K. Hansel, M.D., Editor-in-Chief, Annals of Allergy, Associate Professor of Otolaryngology, Washington University School of Medicine. A Panel Discussion. Bruce Publishing Company, St. Paul and Minneapolis, 1949. An Official Publication of the American College of Allergists, $2.50.

The first part of this book, which is edited by Dr. French K. Hansel, deals with the clinical side of allergic reactions as related to the respiratory tract. Particular stress is put on the nose and accessory sinuses. Dr. Hansel gives a thorough explanation of nasal cytology and emphasizes the tremendous importance of this diagnostic procedure. Six beautiful plates showing different grades of eosinophilia in the nasal secretions are presented.

In a discussion of the problem of tonsillectomy in children with allergic disease, it is emphasized that often the operation affords poor relief of symptoms. The question of allergic disease of bacterial origin is left open. A discussion of the pathology of allergic states is rather weak since the fundamental problem of changes in the small blood vessels is not discussed. But in general this part of the book makes very worthwhile reading and should impress upon any rhinologist that allergic disorders are of tremendous importance in his specialty.

In the latter part of the book, which is a panel discussion, differences of opinion are so pronounced as to indicate that individual interest may be concerned with only one phase rather than with the entire picture. One discussant, for example, tends to overemphasize surgical treatment, while another confines his attention to psychosomatic aspects.

There is an excellent discussion of aviation problems with regard to persons with allergic sensitivity.

Discussants were fairly well in accord as to the usefulness of radium in the treatment of hypertrophied lymphatic tissue in the nasopharynx. However, the reviewer believes that it is now pretty well agreed that radium therapy has been overdone; it is the opinion of many rhinologists that x-ray therapy is much less dangerous and more effective in this condition.

Despite these criticisms, the reviewer believes that this little book, which takes only about two hours to read, is very worthwhile for any rhinologist.

* * *

HUMAN GROWTH—The Story of How Life Begins and Goes On, Based on the Educational Film of the Same Title. By Lester F. Beck, Ph.D., Associate Professor of Psychology, University of Oregon, and Margie Robinson, M.A. Harcourt, Brace and Company, New York. 1949. $2.00.

This book is a welcome addition to the literature on sex education for 'teen-age children.

It will surely be well received by the junior high school group to whom it is especially addressed, and by the various adults who deal with them on this subject. One noteworthy feature of the book is the number, variety and attractiveness of its illustrations. Another excellence is the fullness of the background material on general somatic growth against which the account of specific sexual changes takes its proper place as one important expression of human development. Commendable also is its direct style, with its straightforward, unsentimental description of the processes and significance of various aspects of sexual function, including intercourse.

Only in connection with pregnancy does the author seem to relay a few concepts which fall short of the modern ideal. For instance, he says that a missed menstrual period "warns" the mother of pregnancy (one could prefer a word like "heralds"); he mentions some experience of nausea as a matter of course, even though he minimizes it; he fails to substitute "contractions" for labor "pains." These are such minor details that they would not be worth mentioning except for the fact that we are in an era where young people are ready to profit by every reassurance of the naturalness and happiness of pregnancy and birth.

Perhaps the greatest value of the book is that it is a companion piece to a film of like name, and that each chapter ends with a set of stimulating questions and answers. Both of these devices tend to guarantee that the author will succeed in his intention of "contributing to mental health by a simple honest telling of the story of human growth and by providing a sound basis for discussion with others." For without open discussion one is never quite sure what an adolescent has understood, no matter how clear the text he reads.

* * *

BULLETIN ON NARCOTICS, No. 1, October 1949. United Nations, Department of Social Affairs, Lake Success, New York.

This is the first of a regular series of bulletins on the traffic in narcotics to be issued quarterly by the United Nations, thus continuing similar work initiated by the defunct League of Nations. Subjects considered in this issue are international control of narcotic drugs, opium production throughout the world, an enquiry into the coca leaf situation in South America, determining the origin of opium, and administrative matters pertaining to the commission on narcotics. There are illustrations of narcotic plants, cultivated areas, native plantation workers, maps of countries showing legal and illegal production of opium, laboratory assistants analyzing crude products, etc. The discussion on the origin of opium is disappointing as it contains nothing of historical interest; such material is better presented in current textbooks on pharmacology. In fact the scientific matter in this bulletin is so elementary and limited that it has nothing to offer to scientists and physicians. The bulletin is of interest only to regulation-makers and administrative authorities concerned with legal technicalities of the traffic in narcotics.

* * *

CYSTOSCOPY AND UROGRAPHY. By James B. MacAlpine, D.Sc., F.R.C.S., lately Honorary Surgeon and Surgeon in Charge of the Genito-urinary Department, Salford Royal Hospital. Third Edition, Revised. The Williams and Wilkins Co., Baltimore. 1949. $13.50.

The third edition of MacAlpine's book on "Cystoscopy and Urography" is a text for students, budding urologists, and the surgeon who does an occasional cystoscopy. There is very little change in this edition over the previous books, the first edition being published in 1927, the second in 1936. Chapters on renal tuberculosis and punch operation for prostatic hypertrophy have been added to the third edition. The book goes into meticulous detail about the cystoscope, its construction, ocular system, care, limitations, and general uses. Most of the commonly occurring diseases observed in the practice of office urology are discussed. There are excellent sections on urinary calculi, renal anomalies and the technique of urography. A chapter on diseases of the prostate is included together with a discussion of transurethral prostatic resections as practiced in England. This important and live subject is dealt with inadequately and gives misleading ideas of present-day procedures and results. The same group of cases with the same high operative mortality described in the 1936 edition are again reported in the 1946 book. An incomplete channelling type of operation is again advised and no mention is made of the important advances and improvements in this procedure during the last decade.

Continued and careful study of the book reveals a wealth of material. The section on bladder tumors is especially well done, although the suggested massive cystoscopic coagulation of the larger papillomas is quite laborious and cumbersome when compared to present-day rapid and more thorough transurethral resection methods.

The book is easy to read, concise, easy to handle, printed on good paper, and the illustrations are numerous and well done. Especially commendable are the colored cystoscopic drawings, illustrating the different bladder lesions. Any failure to make this new edition as up-to-date as it might be is partly compensated for by emphasis on fundamentals that have stood the test of time; while not taking the place of our recently published urologic texts, this book is definitely an addition to the cystoscopist's library.

* * *

MAY'S MANUAL OF THE DISEASES OF THE EYE—For Students and General Practitioners. 20th Edition. Charles A. Perere, M.D., Assistant Clinical Professor, College of Physicians and Surgeons, Columbia University, N. Y. 378 Illustrations—32 plates with 93 colored figures. The Williams and Wilkins Co., Baltimore, Maryland, 1949. $5.00.

Since its first edition this book has become one of the American medical classics. As stated in the first edition, the book is intended as a concise, practical and systematic manual of the diseases of the eye for the medical student and the general practitioner of medicine.

The twentieth edition has been completely revised and reset, and many portions of the text have been rewritten. Many of the black-and-white illustrations of the 19th edition which had outlived their distinctness have been omitted or have been replaced by new cuts. The chapter on the diseases of the conjunctiva has been revised and under therapy the newer antibiotics have been discussed. The chapter on the diseases of the optic nerve has been rewritten. One wonders if the long chapter on the complicated subject of disturbances of motility of the eye has a place in a book of this character.

Dr. Perera is to be congratulated on the fact that in the rather extensive revision he has not changed the original purpose or character of the book.

The printing and general format are a distinct improvement over the preceding edition.

The book should maintain its popularity and continue to serve as a reliable and practical introduction to the practice of ophthalmology.

* * *

A SYNOPSIS OF MEDICINE. By Sir Henry Letheby Tidy, K.B.E., M.A., M.D., Extra Physician to H.M. the King, Consulting Physician to St. Thomas' Hospital. Ninth Edition, Revised and Enlarged. The Williams and Wilkins Co., Baltimore, 1949. $7.50.

Nine editions of this well-known English synopsis of medicine may "rather strongly imply usefulness" as one reviewer has said, but it is difficult to determine under what circumstances. To encompass all of medical knowledge in 1,146 pages and do justice to each subject is perhaps asking too much of any author, and Sir Henry has made a brave attempt. The book, however, leaves much to be desired in the way of accuracy, completeness and clarity. Controversial subjects, especially in the realm of therapy, are briefly disposed of with positive statements as though the issue were closed. Criteria for prognosis are set up which seem to be at best based on clinical impressions of the author's, and are at times at variance with the literature. Questionable statements as to etiology, pathology and symptomatology may be readily found. The outline form necessitates too much brevity, and numerous cross references further decrease the usefulness, even for a quick review. And yet the author stops to define "watery eyes—the tear that never drops"! Numerous lists of symptoms are given without indication of which are important and significant.

Examples of the above:

Page 665—"Malignant hypertension has no existence apart from malignant nephrosclerosis."

Page 665—"Physical signs of benign hypertrophy—Cardiac hypertrophy always develops."

Page 665—Treatment of benign hypertension by diet: "No red meat," "strict salt-free diet not advisable," "colonic irrigation once a week"!

Page 795—Histology of kidneys in malignant hypertension: "See benign hypertrophy, but all changes more advanced and more extensive."

In view of the above the reviewer does not believe that Tidy's "Synopsis of Medicine" in any way replaces the many excellent textbooks now available. It is useful as a compendium and has a great deal of valuable information and therefore may have a place for the student who is preparing for examination. It is, however, not recommended as a textbook for medical students desiring more extensive coverage of the field of medicine.

* * *

A TWENTIETH CENTURY PHYSICIAN, Being the Reminiscences of Sir Arthur Hurst, D.M. The Williams and Wilkins Company, Baltimore, 1949. $3.50.

Sir Arthur Hurst was well known in this country and his brilliant work was fully appreciated. But few realized the many facets of his interesting character which are revealed in this little book of memoirs. Hurst is a natural raconteur and one's interest never flags as he reads through the author's vivid recollections of his childhood, medical school experiences, and thus on through his varied and exciting career. The war passages are of especial interest and the thumbnail sketches of innumerable interesting and important people constantly surprise one with unexpected bits of information. It is greatly to be regretted that Sir Arthur's sudden death prevented the narrative from being carried through his later years. A few typographical errors, mostly in spelling of proper names—such as Trosseau for Trousseau—are to be found on pp. 99, 106, 175 and 181; they will no doubt be corrected in a subsequent printing.

* * *

AN ATLAS OF HUMAN SEX ANATOMY. By Robert Latou Dickinson, M.D., F.A.C.S. A Topographical Hand Atlas. Medical Aspects of Human Fertility Series Issued by the National Committee on Maternal Health. Second Edition. 1949. $10.00.

Your reviewer cannot refrain from quoting the introductory paragraph of the preface to the second edition because it describes so poignantly the intent behind the compilation of facts and factors which make up the substance of Dickinson's "Atlas of Human Sex Anatomy." Dickinson expressed his reason for bringing forth a book on sex anatomy as follows:

"The first principle of sex education and marriage counselling gives attitudes precedence over anatomies. Yet function has structure for its machinery, and evasion of instruction concerning anatomy in action is in part responsible for the physical discord alleged by participants to be the original cause for half the marital maladjustments and three-fourths of the divorces and desertions. We in medicine, therefore, are called upon to do our part to persuade morals to wed normals, to induce theology to adopt biology, to integrate within a workable code of ethics a sane science of sex."

This is a singular book in many respects. It encompasses an immense number of observations gathered during many years of a busy practice. It contains facts about female sex anatomy together with those of the male in the same volume, and it correlates them. It is exhaustive in its scope. It is well and abundantly illustrated by several artists and by the author who is no mean artist in his own right. It contains factual information free of sensual details and exaggerations and it presents the links in the chain of sex functions in an orderly way and without apology.

The first edition (1933) must have been in demand sufficiently to prompt the publishers to venture another and better edition. Your reviewer recalls that the first edition had difficulty in gaining recognition but evidently did after the value of the Atlas became recognized. In the second edition some new material concerned with the function of the male sex organ and spermatogenesis has been added. There are various references to Kinsey's book on sex behavior in the male and the author contrasts his observation with those of Kinsey. Here and there minor changes have been made in the text and in the illustrative material, but in general there are no great changes in the substance of the book.

Dickinson's Atlas, by its very nature, has a limited usefulness. Marriage and family counsellors, students of sex and infertility, psychologists and anybody interested in the problems of procreation and copulation will find this book of interest. It is not a book for prudes nor for the mentally immature and does not belong on the parlor table.

* * *

GREEN'S MANUAL OF PATHOLOGY. Revised by H. W. C. Vines, M.A., M.D., Professor of Pathology, University of London, Dean, Charing Cross Hospital Medical School. 17th Edition. The Williams and Wilkins Company, Baltimore, 1949. $8.00.

This book is a clear presentation of the classical lesions of pathologic anatomy, and there are notes on the functional significance of many of these as well as discussions of pathogenesis in an effort to emphasize the dynamic nature of disease processes. Emphasis is placed upon systemic pathology, and much less than half of the book is devoted to general pathology. This leads to considerable fragmentation of the discussions of diseases like tuberculosis which affect many different organs.

Principal attention is given to well-defined diseases and the presentations are inclined to be dogmatic. Allusions are made to investigative work but no lists of references are given. The illustrations on the whole are well chosen and good. The text should be useful in teaching beginning students in pathology but it would not be a very satisfactory reference book.

* * *

DISTRICT NURSING—A Handbook for District Nurses and for All Concerned in the Administration of a District Nursing Service. Eleanor Jeanette Merry, S.R.N., S.C.M., C.S.P., H.V. Cert. Education Officer, Queen's Institute of District Nursing, and Iris Dundas Irven, S.R.N., S.C.M., H.V. Cert. of R.S.I., Superintendent Worcester City Nursing Administration. The Williams and Wilkins Company, Baltimore, 1948. $4.00.

To practitioners in a country continuously disturbed by cries of the high cost of hospitalization, this comprehensive little manual will strike a note of deep interest. Many of the practices described in it are no longer customary in the larger cities of this land, but if ever we return to realistic financing of our state and national debt, it is not improbable that many of them will come back.

The manual is divided into 19 chapters, and ranges through a short history of district nursing, the organization of one of the London institutes of district nursing and suggestions for the training and conduct of district nurses. There are useful chapters on record keeping, simple nursing techniques, and home nursing of certain special diseases. There are illustrated sections on the performance of simple deliveries, simple tonsillectomy and so forth in the home, with suggestions for the district nurse's duties.

There are excellent chapters on the simpler elements of nutrition, family health teaching and the prevention of accidents in the home.

Finally there is a brief discussion of social insurance, vital statistics and the operation of the National Health Service Act.

Every general practitioner and most practitioners in smaller or rural areas are thoroughly familiar with the large amount of competent medical care which may be given in the patient's home, especially if a visiting nurse is available. Well organized district nurses' groups and general medical practitioners will find the manual of value. This reviewer would suggest that there should be a glossary of terms commonly used in Great Britain with suitable translation for readers in the U. S. A. Such terms as "Jeyes' fluid," "Benger's" and "Marmite" are household words in England, but would probably be unintelligible to the average Usanian. The book is neatly printed, of convenient size and readable.

* * *

OBSTETRICS AND GYNECOLOGY—A Synoptic Guide to Treatment. By Beatrice M. Willmott Dobbie, M.A., M.B., F.R.C.S., D.M.R.E., Honorary Surgeon, Birmingham and Midland Hospital for Women. With 22 illustrations. Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, New York, 1949. $5.50.

The book is of mediocre quality and contains nothing of any particular value.

* * *

MODERN PRACTICE IN OPHTHALMOLOGY — 1949. Edited by H. B. Stallard, M.B.E., M.A., M.D., F.R.C.S., Surgeon, Moorfields, Westminster and Central Eye Hospital, London. Paul B. Hoeber, Inc., 1949. $12.50.

This book is one of a series of medical books published under the general editorship of Lord Horder under the group title of "Modern Practice Series." As pointed out in the preface, the purpose of the book is "to give the general practitioner an outline of the modern practice of ophthalmology. It is intended to be a guide to which he may refer when he shares with the eye specialist the responsibility of treating a case of ocular disease and when it falls to his lot to deal with a case in some remote part where there is inevitable delay in obtaining the advice of a consultant."

The book, written under the editorship of H. B. Stallard, assisted by 13 contributors, is midway in its scope between the small textbook usually used by medical students and the textbooks for the student or practitioner of ophthalmology.

The material is arranged in the accepted manner employed in textbooks and on the whole is well chosen, going into sufficient detail to be of value to the practitioner but without doing so to the extent that the subject becomes confusing. The book contains 231 black-and-white, well-chosen and well-printed illustrations. The 30 color plates are excellent as to the choice and the printing. The comprehensive index is particularly noteworthy.

While the selection of material, in general, is excellent, one wonders if the 56 pages devoted to refractions are justified in a book of this type. It would seem better to devote this space to more detailed accounts of treatment of ocular conditions, especially the emergency treatment of ocular injuries. While the book was written by various contributors it would seem wise to have all the therapeutic recommendations either in the metric or apothecary system rather than a mixture of the two.

The quality of the paper, the printing and the binding are outstanding.

The book should be a very welcome addition to the library of the general practitioner who may at times have to care for eye cases.

* * *

SURGERY OF THE HAND. By Sterling Bunnell, M.D. Second Edition. Philadelphia, London and Montreal. J. H. Lippincott Co., 1948.

This book had to be written some time, and it was magnificently achieved first in 1944, and again in 1948 by the same author, internationally recognized as the master surgeon in this field. The development of surgery of the hand to its present high degree has been due in large measure to his unique skill in the three divisions of surgery most concerned in reconstruction of the hand: Plastic surgery, neurosurgery and orthopedic surgery. His ability to treat the hand as an entity, to correct all the disabilities involved, led over the years to a remarkable development of fundamental principles, of ingenious methods and devices, of brilliantly conceived innovations which promise the present maximum possible reconstruction of the badly maimed hand.

From the first chapters on the phylogeny and comparative and normal anatomy of the hand, subjects to which the author brings unique and instructive information, to the making of new thumbs and the transplantation of tendons and nerves, the book is replete with suggestions and methods of great value to every surgeon who is engaged in caring for fresh injuries, burns and infections of the hand, or who is interested in restoring to as complete normality as possible the hand maimed or crippled by these various types of trauma.

Particularly important and instructive are the sections on skin grafting, on the preparation of pedicles, on the transplantation of bones, nerves, even whole fingers, on the restoration of prehension in the absence of a thumb, on the immediate care of infections of the hand and fingers and on the use of anatomically sound incisions which will not increase the residual disabilities that frequently spring from such infections and which can be reduced to a minimum by proper care at the moment of injury or at the time when drainage becomes necessary.

Also, the ingenious methods employed by Bunnell and his associates to correct congenital malformations of the hand are excellently portrayed. The presentation of tumors of the hand by Dr. L. D. Howard, Jr., adds a distinctive and important chapter to the surgical understanding of the hand.

The value of the book is greatly enhanced by numerous excellent illustrations that tell, better than words, the methods and devices employed in securing the best possible function as well as the best appearance of the restored hand.

Patients and surgeons alike will reap untold benefit from this truly monumental work, which makes available to present and succeeding generations the many experiences and the abundant technical knowledge acquired in the lifetime of a busy and talented surgical genius who for many years has made reconstruction, particularly of the crippled hand, his paramount interest.

* * *

DIABETES AND ITS TREATMENT. By Joseph H. Barach, M.D., F.A.C.P., Associate Professor of Medicine, University of Pittsburgh. Oxford University Press, New York, 1949. $10.00.

"This book was not written for Charles Best, the co-discoverer of insulin, nor for the many other research scientists and clinicians who are outstanding authorities in this field. This book offers the general medical man a clinical approach to an understanding of the disease and its treatment." (Preface, p. viii.)

While the former statement is probably quite true, this reviewer does not believe that the latter statement has been well met. The first chapter deals with the history of diabetes and is good in that the many early workers in the field are adequately covered by a brief statement. However, as we get further into the book this fine attribute of a brief and adequate coverage is lost, and we must consider many paragraphs to pick out the basic ideas that have been expressed. Many aspects of the disease are covered in great detail, and as such are interesting to the specialist. But for the general practitioner and the student, the mass of detail accompanying each principle tends to negate the value of these principles and impress one that this is an almost hopelessly complex disease.

Included in the book are some 180 pages of diets and recipes whose value as stated is their easy reference by the patient. This seems unnecessary, for many of the diets vary little from each other in the number of calories but get their variety in altering the ratios of protein, fat, and carbohydrate, which for most patients complicates the picture even more.

The author's concept of the use of salt in heart disease and hypertension is fallacious in that he recommends use of intravenous salt solution for patients with heart disease of Grades I and II and Ringer solution for those with Grades III and IV and again in his recommendation of Eka as a salt substitute in hypertension (Eka is a combination of sodium citrate and sodium malleate).

On the whole, while the author maintains a scholarly and broadminded attitude on the controversial points in present day diabetic management, it is difficult to see where this book helps the average practitioner in the treatment of patients.

California MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION

© 1950, by the California Medical Association

Vol. 72 APRIL 1950 No. 4

Lipid Metabolism

Harry J. Deuel, Jr., Ph.D., *Los Angeles*

SUMMARY

In light of recent advances in the understanding of the metabolism of fats and other lipids, the viewpoint on the importance of fat as a dietary constituent should be changed. It is no longer to be considered as an optional constituent of the diet but as a required component. On the basis of several types of nutritional evaluation (growth, pregnancy, lactation) generous fat diets have been found to give results superior to those obtained by a low-fat regimen. Fat apparently plays a role in promoting protein storage in the tissues.

Recent reports have pointed out that fairly large doses of fat have been introduced by vein into animals over considerable periods of time without any of the harmful effects noted in earlier tests.

The use of isotopes, which has helped toward knowledge of the changes which take place in the breakdown of fat in the tissues, may lead to an understanding of the mechanism involved in the formation and destruction of the ketone acids.

Cholesterol, which has been considered by many to be a causative agent in one type of cardiovascular disease, probably is manufactured in the body at a greater rate than it can originate from foods. The harmful effects of cholesterol may be related to the speed of synthesis and the rate of destruction as well as to the amount of ready-formed cholesterol taken in foods. One instance in which cholesterol feeds exerts a beneficial effect is in the case of rats suffering from overdosage of thyroid extract.

THE lipids or lipoids form a large portion of tissue and food components. Not only are the common fats and oils consisting largely of the so-called neutral fats grouped in this category but also the phospholipids, lecithins, cephalins, and sphingomyelins as well as the cerebrosides. Many interesting components occur in the so-called non-saponifiable fraction of the natural fats. In this fraction are found cholesterol or other sterols and the fat-soluble vitamins. The lipids are classed in a single group because they are all soluble in the organic or fat solvents such as ether, chloroform, and benzene, and because of their uniform pronounced insolubility in water. This presentation will deal only with certain recent contributions which have changed thinking in specific fields of fat metabolism.

The first topic of interest concerns the nutritional value of fat. For a number of years on the basis of the work of Burr and Burr,[2] it has been accepted that certain unsaturated acids, such as linoleic, linolenic, and arachidonic, are essential dietary components. They are required for definite functions such as constituents of cell membranes which the body cannot manufacture. When they are absent from the diet, extensive dermatitis develops which in severe cases may be followed by hematuria and death. While the Burrs' earlier studies were carried out on rats, many other animals including the dog have since been shown to require them.[8] Although proof is lacking for the production of such deficiency symptoms in adult man, there is definite

---

From the University of Southern California Medical School.

Presented before the Section on General Medicine at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

indication that it may be responsible for some of the uncontrollable dermatitis or eczema that occurs in infants.[9]

Moreover, the recent experimental evidence obtained on rats would seem to indicate that fat *per se* also may play an important role in addition to serving as a source of the unsaturated fatty acids. Thus, based on growth studies made in the University of Southern California laboratories, it appeared that diets containing 20 to 30 per cent of fat gave optimum results.[3] Similar results were obtained on pregnancy studies.[3] Lactation, which gives a still more critical test for the nutritional adequacy of a diet, also indicated that a generous supply of fat was to be preferred to a low fat regimen.[3] Lastly, it was found that rats previously on high fat diets could accomplish a greater amount of work than those animals which had been on a low-fat intake. The test involved the determination of the length of time the animals could continue to swim when progressively weighted down with increasing loads.[16]

Samuels and co-workers[15] arrived at conclusions which support these results. When rats were force-fed a diet made up exclusively of proteins, carbohydrates, or fat over a period of 45 days, by a technique developed by these Utah investigators, and the rats were subsequently fasted, survival was considerably longer for the rats previously fed fat than for those given carbohydrate or protein. Whereas the fat-fed animals lived an average of something over 17 days, during a fasting period, those previously on the carbohydrate regimen survived only about ten days, while the protein-fed animals died after a period of only six days. The total amount of work accomplished by the fat-fed rats far outstripped that of rats in either of the other groups. Gilmore[7] and Samuels later showed that the diaphragms from such fat-fed rats required far less carbohydrate when they contracted than did diaphragms from rats which had previously received a high carbohydrate diet.

Finally, extensive investigations on growth, pregnancy, lactation, and a prolonged test over many generations have indicated the identical nutritive value of animal and vegetable fats in furnishing any such lipid necessary for these biological processes.[4]

Within the last several years, a number of investigators have brought out more subtle proof that fat is related to protein metabolism. A most striking example of this has been demonstrated by Swanson and co-workers[17] at Iowa State College. These investigators found that protein-free diets containing 10 per cent of fat were of equal effectiveness with fat-free diets in suppressing nitrogen excretion to the "wear and tear" quota when the diets were fed at 100 or 75 per cent of the caloric requirement. However, when the diets furnished only 50 or 25 per cent of the required calories, the fat-containing one was far superior to the low-fat diet in protein-sparing action. Under such conditions fat in some mysterious way is able to prevent the breakdown of protein, a task which generally has been regarded as a sole property of carbohydrate. Recent evidence has also tended to prove that the administration of linoleic acid in some way decreases the loss of the so-called essential amino acids in the urine and feces.[14] This would offer proof that the growth-promoting activity of the unsaturated acids may in some way be related to the retention of additional protein by virtue of some such reaction. These results would seem to make it reasonable to assign to fat certain metabolic functions other than mere source of calories. If such results are borne out in further studies, it will be necessary to revise earlier views that fat (exclusive of the essential fatty acids) can be completely replaced by carbohydrates without alteration in the nutritive value.

FAT ABSORPTION

One of the more recent developments in the metabolism of fat concerns the mechanism of the absorption of fat. All will remember the widely accepted lipolytic theory[18] which postulates that fat is split completely by the action of the pancreatic enzyme, steapsin, to fatty acid and glycerol as a preliminary to absorption. The fatty acids are absorbed as such through the assistance of the bile acids with which they form water-soluble complexes. Some fatty acids undoubtedly may be absorbed as water-soluble soaps. When they arrive within the epithelial cell, they are promptly resynthesized to the neutral fat, in which form they are transported to the liver and tissues. According to this long-accepted theory, fat absorption results only when such hydrolysis has occurred.

The partition theory of Fraser[5] puts forward an entirely new concept of fat absorption from the gastrointestinal tract. The splitting which is brought about by lipase is only minor. This results in the formation of some mono- and di-glycerides, some glycerol, and a limited quantity of free fatty acid. The mono- and di-glycerides in the presence of bile salts give an extremely effective emulsification medium so that the bulk of the neutral fats is emulsified to such extremely small fat droplets that they can readily be absorbed through the walls of the intestine as unhydrolyzed fat. In order to pass through this membrane, they must be reduced to a diameter of less than 0.5 micron. Fraser[6] has amassed considerable evidence in support of this theory. In one supporting study, the pathways of fat transport and deposition when this foodstuff was fed as neutral fat were compared with the route followed where it was fed as fatty acids and glycerol. Thus when olive oil colored with sudan III was administered, the intestinal cells were filled with fat particles, the lacteals developed a milky appearance, and a characteristic post-absorptive systemic lipemia obtained, and the sudanized oil could be traced to the fat depots. On the other hand, when oleic acid and glycerol were fed, the intestinal cells had a granular appearance, the milkiness in the lacteals was absent, no systemic lipemia developed, and no sudanized fat was deposited in the fat depots. However, a rise in the fat content of portal blood did occur and most of the fatty acid found its way into the liver rather than into the fat depots in the tissues. Such results offer strong circumstantial evidence that the absorption and metabolism of neutral fats differs from that of their constituent fatty acids. It would seem to be sufficiently convincing to warrant serious consideration of the partition theory.

The recent work of Meng and Freeman[13] has also shown that fat can undergo normal metabolism when injected parenterally in dogs if a sufficiently fine emulsion is used. Although McKibben, Ferry, and Stare[12] several years ago were able to cause a gain in weight in dogs given fat emulsions intravenously, to change a negative to a positive nitrogen balance, and finally to produce an increase in total fat content, this was not accomplished without the development of certain pathological symptoms. Thus granulomatous lesions were found in the spleen and lungs and to a less extent in the liver. Toxic reactions to Tween 20® included dilatation of the blood vessels, fall in blood pressure, urticaria, frequent urination and defecation, and vomiting. The reaction would appear to be histamine-like, since it can be counteracted by subcutaneous injection of epinephrine five to ten minutes prior to the injection of Tween 20. In the more recent experiments, positive nitrogen balance has been attained over four-week periods without the development of any symptoms of intoxication either from the fat emulsion or from the emulsifying agents themselves. Three different emulsifying substances were used, namely Span 20® (0.5 per cent), soya bean lecithin (called Asolectin) and sodium cholate. All appeared to be equally innocuous. The routine injection of fat intravenously may shortly become as common as the current use of glucose and amino acids.

The field of investigation of fatty acid oxidation has been a particularly active and fertile one during the last few years. The development of the isotope technique has made it possible to follow the various intermediates of fatty acid oxidation through their several pathways. There now seems to be little doubt that the fatty acids are broken down, two carbons at a time, into acetic acid molecules, thus confirming the beta-oxidation theory.[10] These acetic acid molecules can readily recondense to form acetoacetate; or under some conditions it would appear that they can be resynthesized into fat.

It has long been known that when fat oxidation proceeds at a sufficiently high rate in the absence of carbohydrate, the acetoacetate so formed does not get completely burned and considerable amounts of it may be excreted in the urine. In such circumstances the condition known as ketosis or ketonuria occurs. It has long been disputed whether the disappearance of ketone bodies which results on the metabolism of carbohydrate is to be attributed to the cessation of the production of ketone bodies or to some catalytic effect of the carbohydrate which causes the oxidation of these substances. On the one hand such an action would be explained by the so-called antiketogenesis theory and the other hand by the ketolysis theory.

It has recently been shown that acetoacetate can be caused to disappear in the presence of oxalacetate with the formation of citric acid. This is in line with the earlier hypothesis proposed by Breusch[1] who reported the discovery of an enzyme citrogenase which was held responsible for the formation of citric acid from oxalacetic and beta-keto acids. Although the mechanism of this reaction is not yet entirely clear, it would seem that the acetoacetate disappears by virtue of a coupled reaction in the tricarboxylic cycle which is primarily a mechanism for oxidation of carbohydrate. When large amounts of carbohydrate are available, the citric acid cycle is reacting at an accelerated rate and the acetoacetate rapidly disappears. In the absence of appreciable amounts of carbohydrate, the citric acid cycle of Krebs is at a low ebb and acetoacetate cannot be introduced into this cycle rapidly enough to bring about complete disappearance of acetoacetate. This latest suggestion that acetoacetate is oxidized by incorporation into the citric acid cycle would seem to be an excellent confirmation of the earlier suggestions that it disappears through a coupled reaction with carbohydrate oxidation.

The studies of Lehninger have also been most challenging. Lehninger has succeeded in preparing from liver a substance which will actively oxidize fatty acids under *in vitro* conditions. The enzyme is contained in particulate matter separated from the rat liver. This must be supplemented with adenosine triphosphate, magnesium ions and phosphate buffers. It is also apparent that certain other components are necessary. When the particulate matter was suspended in saline, it was found to be highly active under the previously mentioned conditions. However, when this fatty acid oxidase was suspended in water, it was found to be inactive and could only be restored to activity when—in addition to adenosine triphosphate, magnesium and phosphate buffer — cytochrome C, neutral salts or certain non-electrolytes were added, along with catalytic amounts of oxalacetate or malate.[11]

CHOLESTEROL

Recently there have been interesting developments in relation to cholesterol. Although it has been known for many years that the body possesses the ability to synthesize cholesterol, the ease with which this can be done has only lately been recognized. By experiments in which isotopic carbon has been used, it has been shown that sodium acetate is readily converted in large measure to cholesterol. As it is known that acetate is a particularly abundant metabolite formed during the breakdown of fat, it thus would appear that sufficient material is always available for cholesterol synthesis. There seems to be considerable evidence that the cholesterol which can arise from synthesis may be considerably greater in amount than that which would ordinarily be available in the diet. It would be interesting to know whether the rate of synthesis of endogenous cholesterol is influenced by the predominance of carbohydrate or fat in the diet. Presumably it could not be abolished on a fat-free diet, inasmuch as fat is continually being formed from carbohydrate.

The level of cholesterol in the tissues, however, must depend also somewhat on the rate of destruction, excretion, and conversion to other products. In the laboratory of the University of Southern California Medical School, Marx and a number of collaborators are studying the mechanism of destruction of cholesterol by liver tissue. There seems to be some evidence that this change which takes place may be an enzyme reaction. It is of course most important to find, if possible, what conditions control the destruction of this sterol. The liver apparently is not only one of the sites of synthesis of this material, but also the chief organ where it is apparently destroyed.

There also seems to be some evidence from work of Marx and his collaborators that cholesterol may not always be looked on as a deleterious agent because of its relation to atherosclerosis. It was found that rats fed toxic amounts of thyroid extract could be protected to a very considerable extent if the diet contained 1 per cent cholesterol. The period of survival was considerably prolonged and the animals lost much less weight when cholesterol was available. It has long been known that hyperthyroidism is associated with low content of cholesterol in the blood. Marx has suggested that as a result of prolonged hyperthyroidism the supply of cholesterol may be insufficient to bring about the synthesis of an optimum amount of the adrenocortical hormones, and that the symptoms of intoxication from hyperthyroid activity may partly be ascribed to the partial exhaustion of these hormones and their precursors. When an excess of cholesterol is given, the amount of this sterol available for such synthesis is increased sufficiently so that a normal amount of adrenocortical hormones again becomes available. Further experiments to demonstrate the mechanism of this protective influence will be of great significance. Experiments on human subjects will be awaited with interested.

REFERENCES

1. Breusch, F. L.: Citric acid cycle; sugar- and fat-breakdown in tissue metabolism, Science, 97:490-492, May 28, 1943.

2. Burr, G. O., and Burr, M. M.: A new deficiency disease produced by the rigid exclusion of fat from the diet, J. Biol. Chem., 82:345-367, May 1929.

3. Deuel, H. J., Jr., Meserve, E. R., Straub, E., Hendrick, C., and Scheer, B. T.: The effect of fat level of the diet on general nutrition. I. Growth, reproduction, and physical capacity of rats receiving diets containing various levels of cottonseed oil or margarine fat *ad libitum*, J. Nutrition, 33:569-582, May 1947.

4. Deuel, H. J., Jr., Hallman, L. F., and Movitt, E.: Studies on the comparative nutritive value of fats, J. Nutrition, 29:309-316, May 1945.

5. Frazer, A. C.: Fat absorption and metabolism, Analyst, 63:308-314, May 1938.

6. Frazer, A. C.: The absorption of triglyceride fat from the intestine, Physiol. Rev., 26:103-119, Jan. 1946.

7. Gilmore, R. C., and Samuels, L. T.: The effect of previous diet on the metabolic activity of the isolated rat diaphragm, J. Biol. Chem., 181:813-820, Dec. 1949.

8. Hansen, A. E., and Wiese, H. F.: Studies with dogs maintained on diets low in fat, Proc. Soc. Exper. Biol. Med., 52:205-208, March 1943.

9. Hansen, A. E.: Serum lipids in eczema and in other pathologic conditions, Am. J. Dis. Child., 53:933-946, April 1937.

10. Hunter, F. E., and Leloir, L. F.: Citric acid formation from acetoacetic and oxalacetic acids, J. Biol. Chem., 159: 295-310, July 1945.

11. Lehninger, A. L., and Kennedy, E. P.: The requirements of the fatty acid oxidase complex of rat liver, J. Biol. Chem., 173:753-771, April 1948.

12. McKibben, J. M., Ferry, R. M., Jr., and Stare, F. J.: Parenteral nutrition. II. The utilization of emulsified fat given intravenously, J. Clin. Investigation, 25:679-686, Sept. 1946.

13. Meng, H. C., and Freeman, S.: Experimental studies on the intravenous injection of a fat emulsion into dogs, J. Lab. & Clin. Med., 33:689-707, Feb. 9, 1948.

14. Pearson, P. B., and Panzer, F.: Effect of fat in the diet of rats on their growth and their excretion of amino acids, J. Nutrition, 38:257-265, June 1949.

15. Samuels, L. T., and Roberts, S.: Personal communication.

16. Scheer, B. T., Dorst, S., Codie, J. F., and Soule, D. F.: Physical capacity of rats in relation to energy and fat content of the diet, Am. J. Physiol., 149:194-203, April 1947.

17. Swanson, P. P.: Personal communication.

18. Verzár, F., and McDougall, E. J.: Absorption from the Intestine, Longmans, Green and Co., London, 1936.

* * *

The Newer Antibiotics in Dermatology

FREDERICK G. NOVY, JR., M.D., *Oakland*

SUMMARY

From the experimental and clinical observations published to date it appears that three new antibiotics, polymyxin, chloramphenicol and aureomycin, will prove to be highly efficacious against many of the infectious dermatoses and venereal diseases.

THE antibiotics as they have been developed have all been found to have a wide use in dermatology and syphilology. Penicillin has proved to be specific against many types of infectious cutaneous diseases. Today penicillin is the most active spirocheticidal drug against syphilis. It is the best single form of therapy against all types of this disease. Penicillin is not recommended for use topically because of the danger of sensitizing the patient and thereby precluding its use in more serious systemic conditions. Streptomycin has been found useful in various forms of cutaneous tuberculosis, tularemia, granuloma inguinale and chancroid. It is also of value when used locally but can cause sensitivity. The use of topical tyrothricin has proved successful in many instances of superficial pyogenic infections.

Recently bacitracin has become available. This antibiotic is derived from a strain of Bacillus subtilis. Because of its toxicity it can only be used locally. It is particularly active against Gram-positive streptococci, staphylococci and pneumococci. Meleney and Johnson[7] have found this antibiotic extremely active against various surgical infections. Miller, Slatkin and Johnson[8] felt that it was as effective as penicillin when used topically in such pyogenic infections as impetigo, ecthyma, folliculitis, and infectious eczematoid dermatitis. Contact dermatitis from the use of bacitracin occurs in about 1 per cent of the cases.

In the past two years three new antibiotics have become available for experimental medical use. These are polymyxin, chloramphenicol and aureomycin. The latter two have recently become available for general use. These three new antibiotics have been completely reviewed in an excellent article by Long and his associates.[6]

POLYMYXIN

In May 1947 Benedict and Langlykke[2] reported that sterile filtrates from the Bacillus polymyxa inhibited the growth of various organisms. Stansly, Shepherd and White,[10] working independently, in July 1947 also isolated an antibiotic substance from Bacillus polymyxa. Since that time this substance has been known as polymyxin. The English workers Ainsworth, Brown and Brownlee[1] isolated an antibiotic substance from Bacillus aerosporus Greer and named it aerosporin. This antibiotic is very similar to polymyxin. Their work was reported in August 1947. Polymyxin is a polypeptide or a mixture of polypeptides. It is heat-stable and does not deteriorate when in contact with serum. Experimentally, it has proved extremely active in vitro against Gram-negative bacteria and is primarily bactericidal. Of particular interest in the treatment of cutaneous diseases is the fact that polymyxin is active against Pseudomonas aeruginosa, the organism which frequently produces otitis externa and other stubborn pyogenic infections. Unfortunately this antibiotic is highly nephrotoxic, so that unless this toxicity is overcome the drug will have to be used topically. Because polymyxin is a polypeptide it is not likely to produce sensitivity. For this reason and because of its wide range of antibacterial activity it may well be the ideal topical antibiotic for infections due to Gram-negative organisms.

CHLORAMPHENICOL

Chloramphenicol was isolated from a soil sample taken at Caracas, Venezuela. It is a product of streptomyces. This antibiotic is a crystalline substance which is soluble in water. It does not deteriorate on heating. It is well absorbed by the gastrointestinal tract and serum levels are obtained equal to those produced by parenteral injection. It is rapidly excreted. It is apparently nontoxic when given in therapeutic doses. This drug has been found to be active against a wide range of diseases and is bacteriostatic rather than bactericidal. To date, chloramphenicol has been shown to be highly effective against the rickettsial diseases such as epidemic and endemic typhus, scrub typhus, Rocky Mountain spotted fever and rickettsial pox. Its use in typhoid fever appears to be specific. It is also active against the viruses of psittacosis and lymphogranuloma venereum. This antibotic should prove to be of value in infections due to Gram-negative organisms. As it has been available for only a short time there are no clinical reports on its effectiveness against cutaneous diseases.

AUREOMYCIN

Aureomycin is another antibiotic derived from one of the soil streptomyces (Streptomyces aureofaciens). On culture a golden yellow pigment is produced. Aureomycin is an amorphous hydrochloride, freely soluble in water. It deteriorates rapidly in alkaline solutions and also in human serum. It has an extremely low toxicity and apparently produces no side-reactions. Experimentally, it has been found to be effective against certain Gram-positive and Gram-negative bacteria. It is less useful than penicillin against streptococci, staphylococci and

---

Presented before the Section on Dermatology and Syphilology at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

pneumococci. It is as effective as chloromycetin against Gram-negative organisms. It has been found to be active against rickettsial infections and also against some of the viral infections.

Braley and Sanders[3] recently reported local use of a solution of 0.5 per cent aureomycin borate in a number of ophthalmological conditions. They obtained excellent results in infections due to staphylococcus aureus, D. pneumoniae and H. influenzae. They reported on two patients with tuberculosis uveitis and scrofuloderma who were treated with local and intramuscular aureomycin. The response was equal to that which might have been expected had streptomycin been given. Of particular interest are their findings in the treatment of dendritis keratitis due to herpes simplex. Their patients were greatly benefited by using aureomycin locally. If this finding is substantiated, it will means that for the first time there is a specific drug against the virus of herpes simplex and the drug may be of value in cases of herpes zoster.

One patient with pemphigus has been treated at the University of California with aureomycin given orally and intravenously. While the patient was taking the drug no new bullae developed but during this time the old lesions did not heal. When the drug was stopped, new bullae rapidly appeared. Whether this was a natural remission or a remission due to the use of the drug cannot yet be determined.

VENEREAL DISEASES

Lymphogranuloma venereum: Wright, Sanders, Logan, Prigot and Hill[11] have treated, according to their latest report, a total of 35 patients with this disease. The earlier patients in the series were treated with intramuscular aureomycin, the later with oral aureomycin. The investigators believe there have been only two instances of relapse in this group. Their follow-up, however, has not been complete, as they have been able to follow only 14 of the 35 patients. At the time of their report the average time of observation after discontinuance of the use of the drug was eight weeks. The investigators feel that this drug is far superior to any drug previously used in this disease. The results obtained by them will have to be substantiated in the future before the true value of the drug is known.

Granuloma inguinale: Three patients with this disease were treated by Wright and his associates[11] and reported upon in November 1948. The first was treated in April 1948 and the lesions were completely healed by the first part of June. This patient received a total of 2.02 gm. of aureomycin. The second patient had a diagnosis of granuloma inguinale first made in 1942 and received various types of treatment, none of which were effective. In May 1948 aureomycin was started and a total of 75.6 gm. was given. After three weeks the lesions were completely healed and there had been no recurrence up to the time of the report. The third patient had had granuloma inguinale for ten years and during that time had received many kinds of treatment without benefit. Aureomycin was given, 20 mg. daily for 28 days, and the patient was discharged from the hospital with all lesions healed.

In December 1948 Greenblatt and his associates[4] published a second report of the use of aureomycin in granuloma inguinale. They reported on four patients who had previously received streptomycin but had had relapse. (It was stated that about 10 per cent of the patients treated by streptomycin relapse, and that about half of them respond again when retreated with streptomycin.) The patients that were treated with aureomycin were those that were refractory to streptomycin therapy. In one case healing took place in 14½ days, in another in 19 days. In the third patient the lesions had nearly healed at the end of five days of aureomycin by mouth. In the fourth case aureomycin was given orally for five days and at the end of that time the lesions were negative for Donovan bodies; on the ninth day healing was complete. Greenblatt felt that intramuscular use of aureomycin, beside causing local reaction, was not as effective as oral use.

Syphilis: Heilman[5] found in mice infected with relapsing fever that aureomycin by weight was three times as active as penicillin. Also, in experimental Weil's disease in hamsters it was shown that aureomycin was by weight twice as effective as penicillin. From these observations O'Leary, Keirland and Herrell[9] felt justified in using aureomycin in treating two patients with syphilis. These cases were reported in the early part of December 1948. In one case the patient had primary and secondary syphilis. At first 400 mg. of aureomycin was given orally every four hours and the dose was gradually increased until on the fourth day the patient was receiving 750 mg. at each dose. During this treatment the patient received a total of 44.2 gm. At the end of 24 hours there was typical Herxheimer reaction. Darkfield examination became negative for spirochetes in 60 hours, and even 12 hours before this the spirochetes were sluggish and few in number. There was a satisfactory serologic response. At the beginning of treatment the Kahn test showed 256 units and on subsequent tests the number declined; 41 days from the beginning of treatment the reaction was 32 units. In the second case the patient had primary syphilis. Spirochetes were observed on darkfield examination but results of a Kahn test were negative. The patient received 750 mg. every four hours for 15 days; the total dose was 67.5 gm. Results of darkfield examination at the end of 12 hours were positive, but at the end of 16 hours they were negative. At the end of four days the primary lesion was half the original size and in 15 days was entirely healed. During the treatment the Kahn test reaction became positive (8 units) but at the time of the last examination was again negative.

This is an extremely important observation because it may mean that aureomycin is another antibiotic effective against syphilis. Syphilographers have been much concerned of late because they feel that there are developing penicillin-resistant strains of spirochetes. If this is so, aureomycin may well be the answer.

2938 McClure Street.

REFERENCES

1. Ainsworth, G. C., Brown, A. M., and Brownlee, G.: "Aerosporin" an antibiotic produced by Bacillus aerosporus greer, Nature, London, 160:263, Aug. 23, 1947.
2. Benedict, R. G., and Langlykke, A. F.: Antibiotic activity of Bacillus polymyxa, J. Bact., 54:24, July 1947.
3. Braley, A. E., and Sanders, M.: Aureomycin in ocular infections, Ann. N. Y. Acad. Sci., 51:280, Nov. 1948.
4. Greenblatt, R. B., Dienst, R. B., Chen, C., and West, R.: Oral Aureomycin therapy in the therapy of streptomycin-resistant granuloma inguinale, Sou. Med. J., 41:1121, Dec. 1948.
5. Heilman, F. R.: Aureomycin in the treatment of experimental relapsing fever and leptospirosis icterohemorrhagica (Weil's Disease), Proc. Staff Meet. Mayo Clinic, 23:659, Dec. 8, 1948.
6. Long, P. H., Schoenbach, E. B., Bliss, E. A., Bryer, M. S., and Chandler, C. A.: The experimental and clinical use of polymyxin, chloromycetin and aureomycin, Calif. Med., 70:157, March 1949.
7. Meleney, F. L., and Johnson, B.: Bacitracin therapy. The first hundred cases of surgical infections treated locally with the antibiotic, J.A.M.A., 133:675, March 8, 1947.
8. Miller, J. L., Slatkin, M. H., Johnson, B. A.: Local use of bacitracin, J. Invest. Derm., 10:179, March 1948.
9. O'Leary, P. A., Keirland, R. R., and Herrell, W. E.: The oral administration of aureomycin (duomycin) and its effect on Treponema pallidum in man, Proc. Staff Meet. Mayo Clinic, 23:579, Dec. 8, 1948.
10. Stansly, P. G., Shepherd, R. D., and White, H. J.: Polymyxin, a new chemotherapeutic agent, Bull. Johns Hopkins Hosp., 81:43, July 1947.
11. Wright, L. T., Sanders, M., Logan, M. A., Prigot, A., and Hill, L. M.: The treatment of lymphogranuloma venereum and granuloma inguinale in humans with aureomycin, Ann. N. Y. Acad. Sci., 51:318, Nov. 1948.

ADDENDUM

Since this paper was written there have been many interesting reports on the use of these antibiotics in dermatology.

Miller[9] and his associates have made a further report on the use of bacitracin in various kinds of pyodermas and have noted continued excellent results. It is important to note that they have continued to find less than 1 per cent sensitivity reactions in their large group of patients.

Aureomycin has been found to be effective in the Kaposi's varicelliform eruption according to the reports of Baer and Miller[2] and those of Bereston and Carliner.[3] One patient with eczema vaccinatum recovered rapidly after the use of aureomycin.[10] The topical use of aureomycin in strength of 0.5 per cent in water has been found to be effective against herpetic stomatitis.[1, 6]

Binder and Stubbs[4] have treated herpes zoster with aureomycin and obtained good results in four cases. There were no residual effects.

A patient with molluscum contagiosum, according to Guy, Jacob and Guy,[7] responded dramatically to aureomycin.

Dermatitis herpetiformis has been treated with aureomycin and the Robinsons[11] feel it more effective than sulfapyridine.

In the treatment of venereal diseases there have been several more reports concerning the use of aureomycin. In lymphogranuloma inguinale the results appear promising. Hill[8] has made an additional report of nine more cases of granuloma inguinale and the response was as satisfactory as it was in the first three cases he reported. Whether this antibiotic will be as effective as streptomycin in this disease will have to be determined after more cases have been reported.

O'Leary and Kierland, at the Mayo Clinic, have continued their work using aureomycin in the treatment of syphilis with good results. O'Leary, at the recent meeting of the American Academy of Dermatology and Syphilology, stated that he felt that aureomycin can do all that penicillin does in syphilis. Rodriques and co-workers[12] used aureomycin in treating 27 patients with early syphilis. All were followed for three months and the investigators felt that results were as satisfactory as with penicillin.

Chloromycetin has also been used in the treatment of syphilis. Romansky, at a recent meeting of the American Academy of Dermatology and Syphilology, reported upon use of the drug in 25 cases. He felt that the results were satisfactory.

Chen, Dienst and Greenblatt reported on one case of chancroid in which results of treatment with aureomycin were satisfactory.

From these preliminary reports the use of these new antibiotics appears most promising, but at this time their exact value in relation to other drugs cannot be stated until larger groups of cases have been followed and reported.

REFERENCES

1. Arnold, H. L., Jr., Domzalski, C. A., Jr., and Austin, E. R.: Aureomycin mouthwash for herpetic stomatitis (canker sores), Clinic Proceedings, Honolulu, 15, Nov. 1949.
2. Baer, R. L., and Miller, O. B.: Disseminated cutaneous herpes simplex (Kaposi's varicelliform eruption), J. Invest. Derm., 13:5, July 1949.
3. Bereston, E. S., and Carliner, P. T.: Treatment of a case of Kaposi's varicelliform eruption with aureomycin, J. Invest. Derm., 13:12, July 1949.
4. Binder, M. L., and Stubbs, L. E.: Treatment of herpes zoster with aureomycin, J.A.M.A., 141:1050, Dec. 10, 1949.
5. Chen, C. H., Dienst, R. B., and Greenblatt, R. B.: Oral aureomycin therapy for chancroid: Report of Case, J.A.M.A., 141:205, Oct. 8, 1949.
6. Distelheim, I. H., and Sulzberger, M.B.: Aureomycin employed locally in painful mouth ulcerations (Stomatitis aphthosa or periadenitis mucosa recurrens), J. Invest. Derm., 13:115, Sept. 1949.
7. Guy, W. H., Jacob, F. M., and Guy, W. B.: Aureomycin in molluscum contagiosum, Arch. Derm. & Syph., 60:629, Oct. 1949.
8. Hill, L. M., Wright, L. T., Prigot, A., and Logan, M. A.: Aureomycin in granuloma inguinale, J.A.M.A., 141:1047, Dec. 10, 1949.
9. Miller, J. L., Slatkin, M. H., and Johnson, B. A.: Evaluation of bacitracin in local treatment of pyogenic infections, Arch. Derm. & Syph., 60:106, July 1949.
10. Perry, F. G., and Martineau, P. C.: Eczema vaccinatum, rapid recovery following treatment with aureomycin, J.A.M.A., 141:647, Nov. 5, 1949.
11. Robinson, H. M., Robinson, H. M., Jr., and Robinson, R. C. V.: The therapeutic value of aureomycin in dermatitis herpetiformis, J. Invest. Derm., 12:9, July 1949.
12. Rodriques, J., Plotke, E., Weinstein, S., and Harris, W. W.: Aureomycin and its effect in early stages of syphilis, J.A.M.A., 141:771, Nov. 12, 1949.

Who Are Prospective Neurotics?

JULIUS BAUER, M.D., *Los Angeles*

SUMMARY

Emotions of any kind and experienced at any age are etiologic factors of neuroses only in predisposed persons.

Predisposed persons are those of neuropathic and psychoneuropathic constitution. This is characterized by excessive excitability and abnormal reactivity of the nervous system. This involves, in various degree and proportion, the autonomic nervous system as well as the higher cerebral functions including associative and emotional mental reactions.

Objective signs of autonomic nervous imbalance can be detected by physical examination. In the mental sphere, psychoneurotic constitution can be recognized by emotional imbalance, excessive, inadequate, untimely reactions ("psychic dysmetry").

Neuropathic and psychoneuropathic constitution per se is compatible with perfect health. It deserves attention, however, in that its carriers may play an important role in cultural and social life and so exert a great suggestive influence on the mass of people.

The type of neurosis or psychoneurosis and the symptoms of it depend chiefly on the constitutional morbid predisposition (constitutional biologic inferiority) of certain organs or organ systems and on the kind of emotional situations which the patient is unable to cope with.

The great number of neuroses, psychoneuroses and psychosomatic diseases among patients consulting them makes it imperative that internists and general practitioners be capable of making the correct diagnosis and of carrying out the indicated treatments by "minor psychotherapy."

WHO would contend that he never experienced a feeling of guilt, aggressiveness, rage, or hostility toward a member of his family, a friend or superior, that he never felt disappointed in his competitive striving or in his desire to be loved, that he never had a feeling of inferiority or never had to forget some sexual experience of his childhood or adolescence? Yet to dig out such emotions from subconsciousness with somewhat various technique is the aim of psychoanalysis. They serve as guides for a more or less correct interpretation of a personality and should pave the way for its correction. Why should all these common emotions and socially unacceptable attitudes, repressed as they were, cause psychoneuroses only in a relatively small group of persons if they prove to have been innocuous for the majority of persons? They cannot be the real cause; they may at best be contributory factors in the etiology of psychoneuroses and formative elements of their shape.

Anxiety is a physiologic reaction to adequate extrinsic stimuli. No hero was free from it in combat and many experienced its somatic repercussion upon the gastrointestinal tract. This acute and temporary state of psychosomatic disturbance is a normal physiologic phenomenon. Why did "war neurosis" of one type or another develop in a certain number of soldiers, even in those who never had the experience of combat? Why does an accident produce psychoneurosis in some persons and not in others? Why do only relatively few women respond to the cessation of the ovarian function with neurotic symptoms or develop "involutional melancholy"? Why do only certain individuals present signs of mental disturbance if they are afflicted with hyperthyroidism, Addison's disease or Cushing's disease? From a strictly logical viewpoint it is not justified to call combat or war, accident, menopause or the other mentioned endocrine disorders *the cause* of the mental disorder. They are only part, although an obligatory part, of the cause which consists of the cooperation of several factors. A complex constellation of several factors rather than one cause usually is operative in the majority of diseases both somatic and psychic. One of these factors is the individual constitution, the individual set-up of genes which accounts for the uniqueness of an individual personality and involves a various degree of predisposition. With regard to neurotic and psychoneurotic disorders this individual constitutional predisposition is termed *"neuropathic or psychoneuropathic constitution."*

There are great individual differences in the reactivity and irritability of the nervous system, both cerebrospinal and autonomic. The variable liveliness of nervous reactions extends from the highest cortical functions, such as association of ideas and emotions, to the spinal reflexes and actions of the autonomic nervous system. The autonomic nervous system is the mediator between mind and body, since it transmits emotions to the somatic sphere

---

From the Department of Medicine of the College of Medical Evangelists in Los Angeles.

either directly or through the mediation of the endocrine system, particularly the adrenals. Emotions, in turn, are influenced by the activity of endocrine glands, such as the thyroid, the gonads, the pituitary, the pancreatic islets, and the parathyroids. Let us recall for instance the psychic manifestations of hypoglycemia or the mood and behavior of a patient with hyperthyroidism or tetany.

Neuropathic or psychoneuropathic constitution is a term to designate individuals with excessive excitability and reactivity of the nervous system. Any situation ever so common may become overrated in its affective charge and release inadequate emotions. Occurrences of daily life may arouse abnormal emotional reactions in psychoneuropathic persons. One could speak of "psychic dysmetry" to designate the misjudgment of the affective charge of an experience. For example, a housewife who was frightened by a mouse running through the kitchen. A few days later a full-fledged hyperthyroidism developed as a result of this wholly inadequate emotion. Psychic dysmetry is recognized by the emotional instability, the excessive, inadequate, and untimely reactions of a person and, therefore, his maladjustment to various life situations.

Signs of hyperirritability of the autonomic nervous system are vasomotor phenomena such as flushing of the neck and upper part of the chest, dermographia, moist and frequently cold hands, excessive perspiration in the axillae, considerable sinus arrhythmia, orthostatic tachycardia, or slowing down of a rapid pulse rate on stooping (Erben's sign) or on pressure on the eyeballs with the lids closed (Aschner-Dagnini's sign). These incontestable indicators of exaggerated irritability of the autonomic nervous system are not signs of a disease but they are invaluable criteria of neuropathic constitution, and therefore of prospective reactions to various stimuli and situations, both physical and psychic.

FAMILIAL COINCIDENCE

The genotypical nature of neuro- or psychoneuropathic constitution is proved by the fact of its duration throughout life and by the family history. Several members of the same family may exhibit various manifestations of the same neuropathic disposition. Such manifestations may be limited to the aforementioned signs of hyperexcitability of the autonomic nervous system, with or without exaggerated deep reflexes, but without actual complaints. One member of the family may fall ill with symptoms diagnosed as neurasthenia or as neurocirculatory asthenia. The synonymous terms "effort syndrome" and "soldier's heart" indicate that this condition occurs more frequently and becomes more interesting and important in times of war. At these times the hardships and emotional upsets of military service act as provocative factors in transmuting constitutional "inadequacy" into actual disease. Yet there is nothing particular or specific about this syndrome occurring in neuropathic soldiers. How little known the true—the constitutional—nature of this condition is, may be inferred from the fact that the case of a 45-year-old soldier was considered worthy of report in the *Journal of the American Medical Association.*[4] The man had been discharged from military service during the First World War by reason of "neurocirculatory asthenia," the pulse with the patient in a standing position was 144, and 92 when he was recumbent. The patient was discharged from the Army again during World War II for the same reason, with exactly the same symptoms and signs. The man was able to make a fair adjustment to the life of a farmer, but not to that of a soldier. Nothing else could be expected, considering the constitutional basis of neurocirculatory asthenia. In cases of this kind another member of the same stock may show anxiety or compulsion neurosis, hysteria, some kind of addiction, or criminal psychopathy. All these various types of functional disorders of the nervous system, pertaining to both the mental and somatic spheres, arise from such neuropathic constitution.

PSYCHONEUROSIS IN LEADERS OF THOUGHT

It must be borne in mind, however, that we owe much of our cultural achievements to persons of this constitutional type. Artists and scientists with rapid and intense emotional and associative reactivity often are individuals of neuropsychopathic constitution. It appears to the author, with regard to many products of modern art, that those who are concerned with mental hygiene should pay attention also to this field of modern life. They should see to it that fantastic outgrowths of schizoid human minds be branded as such for the public. The suggestibility of the mass can hardly be overrated. Its guidance is often in need of interferences from psychiatry. This is all the more true with regard to the dangerous neuropsychopathic personalities who aspire to political leadership by virtue of their extraordinary intelligence which may be combined with moral deficiency. There is no need for exemplification from recent world history.

The consequences of psychic shock depend on the individual constitution, as is illustrated by Murri's studies on the survivors of the earthquake of Messina. All had mental disorders in the first few days following the catastrophe. Some days later the majority of the survivors were adjusted and became mentally normal again. After several months only representatives of the constitutional neuropathic type were still abnormal.

Hysterical reactions such as crying spells, mutism, or convulsions may occur after a severe psychic blow, even in normal persons, without any subsequent neurosis. Bismarck, for instance, was reported to have had a crying spell after the decisive defeat of the Austrians by the Prussians in 1866, and he was neither hysterical nor otherwise psychopathic. These facts are mentioned because they demonstrate that various types of functional nervous diseases are but exaggerations, prolongations and complications of reactions inherent in the average nervous system.

The more hyperreactive the given nervous system is, the more trite and insignificant may be the psychic or physical shock that precipitates neurosis.[3]

There is one exception to this rule. The inmates of the German concentration camps did not have neuroses when they were liberated by the Allies. The physical state of half-starvation and organic sickness, and the overwhelming prolonged continuous fright of being tortured or murdered in the next hours killed the cerebral functions that are operative in the production of neurosis. Only later did some of these persons break down in one way or another.

The type of neurosis or psychoneurosis and the symptoms of it depend chiefly on two factors, the constitutional morbid predisposition (constitutional biologic inferiority) of certain organs or organ systems, and the kind of psychic complex that is operative in the subconscious background. Nervous indigestion of different varieties occurs more frequently in families exhibiting other signs of constitutional weakness of the digestive tract, such as peptic ulcer or cancer of the stomach. Cardiac neuroses often affect members of families haunted by organic heart disease.[3]

The conversion of an emotional situation into somatic symptoms frequently makes use of a symbolic "organ language" which conforms to commonly used verbal expressions to designate certain emotions. Conflict situations may give one "a headache"; grief may cause "heartache." One person may be a "pain in the neck" to another. And one may be "sick and tired" of something or unable to "stomach" it any longer. To understand the mechanism of indigestion, nausea, vomiting or "gas pain," it is just as important to investigate along these lines with common sense and knowledge of human nature as to study the digestive tract with the x-ray machine.

The modern psychoanalytical school approaching the psychologic aspect of various organic diseases tries to correlate definite morbid processes with definite characteristics of the personality.[1] Although it is true that different emotions may be accompanied by repercussions upon different parts of the autonomic nervous system, it remains to be proved that specific emotional constellations and personality traits determine the type and localization of an organic (psychosomatic) disease. It is difficult for the critical internist to accept the theory that peptic ulcer results from repressed wishes to receive and to take, that colitis with diarrhea serves as a substitute for the giving of real values or that constipation should be the reaction against the obligation to give. By the way, the same infantile tendencies to receive and to be taken care of that were found in the background of patients with ulcer of the stomach were also found in psychoanalysis of patients who had diabetes mellitus. Repressed aggressive and hostile tendencies certainly may be disclosed in patients with hypertension. They also may be found as aggravating factors of hypertension. It is probable, however, that they also can be found in persons without hypertension. The genetic set-up, the constitution of an individual, which comprehends far more than the psychologic features of his personality, is decisive whether or not essential hypertension, peptic ulcer or ulcerous colitis will develop with or without the cooperation of an emotional stress. Up to date the author cannot accept the theory of specific psychosomatic ailments arising from specific emotional situations.

Negation of such a specific correlation has important practical implications. Of what use should it be to spend years and fortunes in order to dig out from the subconscious mind every forgotten infantile experience charged with emotions? Alexander,[2] one of the psychoanalytical leaders, makes the following surprising statement:[2]

"It is not necessary—nor is it possible—during the course of treatment to recall *every* feeling that has been repressed. Therapeutic results can be achieved without the patient's recalling all important details of his past history; indeed, good therapeutic results have come in cases in which not a single forgotten memory has been brought to the surface. Ferenczi and Rank were among the first to recognize this principle and apply it to therapy. However, the early belief that the patient 'suffers from memories' has so deeply penetrated the minds of the analysts that even today it is difficult for many to recognize that the patient is suffering not so much from his memories as from his incapacity to deal with his actual problems of the moment. The past events have of course prepared the way for his present difficulties, but then every person's reactions are dependent upon behavior patterns formed in the past. Merely remembering an intimidating or demoralizing event does not change the effect of such an experience."

"MINOR PSYCHOTHERAPY"

Alexander and his school plead for a much shorter type of psychotherapy than orthodox psychoanalysis. This refreshing attitude cannot be overemphasized. What we badly need is better training of every physician in the diagnosis and management of psychosomatic relations rather than a great number of highly specialized psychiatrists and psychoanalysts. Every physician and particularly the internist must be capable of practicing the art of "minor psychotherapy."

Of the last 2,000 patients who consulted the author, 32.3 per cent had pure neurosis or psychoneurosis of one type or another. The adjective "pure" means that the very common cases of somatic diseases with a superimposed neurotic component were not included. No cases of peptic ulcer, hyperthyroidism or essential hypertension were among that 32.3 per cent. In the same material the frequency of essential hypertension—blood pressure over 160 mm. of mercury systolic and 90 mm. diastolic—was 16.5 per cent. This material is in no way selected and is representative of that encountered by every internist.

The figures also are in full conformity with those of others. The internist cannot refer 30 to 50 per cent of his patients to a psychiatrist. If he permits himself to be incompetent in the art of minor psychotherapy and does not know better than to have a nurse administer vitamin or hormone injections for indefinite periods to patients who do not need them, he has no right to complain about the practices of various cultists.

The principle of "minor psychotherapy" is making the patient understand the relationship between the symptoms and his emotional stress. This requires, to be sure, a certain degree of intelligence on the side of the patient. It requires, furthermore, an authoritative but sympathetic personality of the physician who must know how to gain full confidence of the patient and how to overcome his repressed wish not to be cured. In the author's opinion, it is more important that the interpretation of the situation offered to the patient be faithfully accepted than that it be correct in every detail.

1680 Vine Street.

REFERENCES

1. Alexander, F., and French, T. M.: Studies in Psychosomatic Medicine, Ronald Press Co., New York, 1948.

2. Alexander, F., French, T. M., and Others: Psychoanalytic Therapy, Ronald Press Co., New York, 1946.

3. Bauer, J.: Constitution and Disease. Applied constitutional pathology, 2nd ed. Grune & Stratton, New York, 1945.

4. Bishop, L. F., and Kimbro, R. W.: Neurocirculatory asthenia, J.A.M.A., 122:88, May 8, 1943.

* * *

Doctor: Not so sick, my lord,
As she is troubled with thick-coming fancies,
That keep her from her rest.

Macbeth: Cure her of that:
Canst thou not minister to a mind diseas'd,
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And with some sweet oblivious antidote
Cleanse the stuff'd bosom of that perilous stuff
Which weighs upon the heart?

Doctor: Therein the patient
Must minister to himself.

Macbeth: Throw physic to the dogs:
I'll none of it.

Macbeth. Act V, Sc. 3.

Some Phases of Postoperative Atelectasis

The Role of Ciliary Action in Absorption of Air

A. C. HILDING, M.D., *Duluth, Minnesota*

SUMMARY

The primary cause of postoperative atelectasis is the production of excessive quantities of mucus which occlude one or more air passages. This mucus is moved upward in the bronchial tree in successive masses, which carry with them bubbles of air, at the same time as the gases of the air are being absorbed by the venous blood. When all of the air has been removed, negative pressure develops which is equal to the effective ciliary power acting upon the contained masses of mucus. This negative pressure is, in all probability, maintained solely by ciliary action.

THE condition of postoperative atelectasis has been known for about a hundred years. The literature about it is voluminous. Seybold, in a recent publication, presented a comprehensive clinical picture of the condition. Factors contributing to the production of the condition, he stated, are trauma to the chest, which makes breathing painful, splinting of the diaphragm, and excessive production of bronchial secretion. Seybold said that he directs treatment toward reduction of the quantity and viscosity of bronchial secretion. In reviewing the physiology of the passive movements of the bronchial tree (widening, narrowing, lengthening and shortening, according to the radial and linear tractions) he pointed out how the loss of these movements favors atelectasis. He advocated the avoidance of morphine and opium derivatives and favored enlisting the conscious effort of the patient to breathe deeply and to cough.

Seybold quotes West as stating a hundred years ago that ". . . the causes which tend to produce bronchitic collapse resolve themselves into the following: firstly, the existence of mucus in the bronchi which is liable to produce obstruction; secondly, weakness, or inefficiency of the inspiratory power, however caused; thirdly, inability to cough and expectorate, and thus remove the obstructing mucus. Of these conditions the first must be considered as the exciting cause, and the others as predisposing causes, cooperating with the first, but incapable without it, of producing collapse." Seybold expressed the opinion that it would be difficult today to improve on this summary of causes from the standpoint of accuracy, succinctness or clarity. To the author, however, it seems that one of the most important factors has not been mentioned.

Beecher, demonstrating the effect of laparotomy on respiration, found that the vital capacity, the tidal volumes, supplemental and complemental air were all reduced and the respiratory rate increased after laparotomy. The minute volume, however, remained unchanged, indicating that respiration is shallow after laparotomy. Henderson expressed belief that shallow breathing strongly predisposes to bronchial obstruction and thus to atelectasis. He referred to Gunn's statement that the respiratory tract frees itself from the accumulation of secretions through (1) the cough reflex, (2) the action of cilia and (3) peristaltic movements.

Dripps and Deming, in a study of a series of 1,240 cases of upper abdominal operation, noted 68 cases of atelectasis and pneumonia, an incidence of 5.5 per cent. Atelectasis, they found, developed with greater frequency (1) in males, (2) in smokers, (3) after operations in the upper abdomen, (4) in patients with acute and chronic respiratory infections, (5) with increasing age and (6) with the increasing length of the operation.

Schmidt and Mousel pointed to decreased pulmonary ventilation and inadequate endobronchial drainage as the immediate causative factors, depending, in turn, upon these remote causes: (1) the effect of the anesthetic on the patient, (2) the position of the patient at the time of operation and (3) the type of operation. They felt that the effectiveness of bronchial ciliary action is reduced by the overwhelming effect of the mass of the secretion.

In Marshall's opinion postoperative atelectasis is the result of reduced inspiratory force, reduced lung expansion and reduced cough—all of which may be due to pain. Because of insufficient aeration, he stated, the secretion collects until finally "thick mucus plugs the bronchus." The air beyond the obstruction is quickly absorbed into the bloodsteam and a negative pressure develops which may retract the mediastinal structures to the involved side.

Carlson and Luckhardt, making a classic study of the nervous control of the lungs in reptilia almost 30 years ago, found, among other things, that mechanical and electrical stimulation of the alimentary tract induced reflex lung contraction or lung tetanus. The lung contractions and tetanus induced reflexly from mechanical stimulation of the posterior nares were particularly striking and were marked from stimulation of the cloaca, rectum and bladder.

Presented before the Second General Meeting of the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

Coryllos and Birnbaum made extensive studies of postoperative apneumatosis and postoperative pneumonia and concluded that the determining cause of postoperative atelectasis was bronchial obstruction by viscid bronchial exudate. They found the dominant factor in postoperative pathologic changes in the lungs to be bronchial obstruction and impairment of free bronchial drainage. Postoperative immobilization of the thoracic cavity by pain, and impairment of cough and respiratory movement by narcotics and posture were thought to be only favoring factors.

Best and Taylor described the rich elastic tissue in the bronchial tree, most of which is disposed longitudinally in the tunica propria. This elastic tissue is responsible for the recoil of the bronchial tree during expiration and, probably, in large part, for the recoil mechanism of the whole lung. They cited Mechlin's division of the bronchial tree into two parts: The first part, extending from the trachea to the terminal bronchi, inclusive, is simply an air conduit and possesses no respiratory function. The second part is the portion below the terminal bronchi, and includes the terminal bronchioles, where the muscle development is greater than in any other part of the tree. When this muscle is fully contracted it exerts a valve-like action which can completely shut off the air supply to the chambers beyond. These investigators stated that the intrapleural negative pressure is maintained by the elastic recoil of the lungs and amounts to a pressure from —4 to —5 mm. of mercury.

Habliston made some measurements of the negative pressure produced within the chest during massive collapse of the lung. He considered the normal average negative pressure in the pleura to be between —40 and —70 mm. of water. He attempted to measure the intrapleural negative pressure in four cases of massive atelectasis. In the first case, the water of the manometer was sucked into the pleural cavity; the height of the manometer was 130 mm., hence, the negative pressure was greater than —130 mm. In the second case, the manometer was 120 mm. in height and the intrapleural negative pressure was greatly in excess of this—how much, the author did not know. In the third case, the negative pressure varied between —246 and —270 mm. of water. When 600 cc. of filtered air was introduced into the pleural cavity, the pressure immediately dropped to —80 to —100 mm. of water. In the fourth case a negative pressure of between —337 and —432 mm. of water was shown. The negative pressure on the normal side was found to be —40 to —80 mm.

Hawkins, in reporting measurement of the negative pressure in three cases of atelectasis, found the highest negative pressure was —162 to —202 mm. of water. Ferris found a negative pressure of —100 to —160 mm. of water in a case of atelectasis.

In summary, it may be stated that the contributors to the literature on postoperative atelectasis agree that it is due to a plug of viscid mucus which tightly closes a bronchus and prevents the passage of any air past it toward the alveoli. The air entrapped behind this plug is completely absorbed, according to the known laws of physics, causing collapse and negative pressure in that part of the lung. The plug of mucus does not move away, either because the ciliary action is deficient or because the plug is too viscid to be moved by the cilia.

In many respects this view seems to be essentially correct; however, there are some discrepancies in it which should be analyzed. If there is such a viscid plug of mucus filling the bronchus, so that the bronchus is completely corked, then the pathologist should find it at autopsy. Those to whom the author has spoken have never found such a plug; sometimes there is a little soft mucus. In asthma, such mucous plugs do form and are actually incorporated with the wall of the lining mucosa. The result, however, is not atelectasis but the very opposite—emphysema. The mucus acts like a ball-valve, and, as the bronchus expands on inspiration, the air passes by the mucous plug. Then, as the bronchus closes against the sides of the plug on expiration, the air becomes trapped behind it and emphysema results.

Experienced endoscopists to whom the author has spoken have found, on bronchoscopic examination of patients with atelectasis, only a little soft mucus which is readily aspirated through a long, narrow suction tube. They are sometimes amazed at the profound effect of removing so little.

CILIARY ACTION IN MOVING MUCUS

The claim is made that the ciliary action is insufficient or has ceased entirely or that the mucus is too heavy for the cilia to handle. The author did some experiments a few years ago testing the ability of ciliated mucous membrane to handle very viscid mucus. It seemed that the more viscid the mucus, the better the cilia handled it. No basis could be found for the statement that the ciliary action is insufficient or has ceased; that seems to be only an inference. If the entrapped air is absorbed into the bloodstream, it must be absorbed rapidly, and much faster than it is absorbed elsewhere in the body. As to the time lapse preceding the development of postoperative atelectasis, surgeons, anesthetists and internists use such expressions as "It develops within a couple of hours," "It comes immediately," or, "It occurs practically on the table." Another question arises: If the negative pressure is so extreme that the mediastinum is displaced, is it possible, from the standpoint of physics, for the venous blood to take up all of the contained air?

Why should the postulated mucous plug become fixed, if it does? Perhaps it is because the stream bed in which it moves becomes narrower, as it progresses toward the larynx, although the bronchi grow larger. It has been thought that the bronchial tree increases its cross-sectional area with each subsequent branching as it progresses toward the alveoli, so that if the entire tree were made into one passage, it would look like an inverted funnel. That is true of the arterial tree. If the mucus does advance toward the trachea into an ever-narrowing funnel, until it becomes fixed, why does it not, if it is as soft as described, slide down into the wider portions of the funnel where there is a negative pressure?

The literature was searched for figures on the cross-sectional area of the bronchial tree at different levels but none were found. Consequently, a few specimens were obtained and measurements made. Between the larynx and the small bronchioles down to 1.5 mm. in diameter, there was comparatively little or no increase in cross-sectional area as the bronchial tree divided and subdivided. The inverted funnel concept of the volume of the bronchial tree seems to be somewhat in error. However, on the other hand, the cross-sectional area did not grow smaller as it divided. Consequently, there still does not seem to be any adequate explanation why the soft mucus does not slide downward into the region of negative pressure.

It may be of value to review briefly the physical steps by which air is absorbed from different portions of the body. Some years ago, in cataract operations, air was injected into the anterior chamber at the end of operation in order to prevent adhesions between the iris and the incision (Figure 1). From four to six days* is required for such a bubble in the anterior chamber to be absorbed. Atmospheric pressure is about 760 mm. of mercury. In round figures then, the partial pressures of the gases which were injected into the anterior chamber were: nitrogen 597 mm., oxygen 158 mm., carbon dioxide 0.3 mm. and water 5 mm. The author has never seen any comparable figures on the partial pressures in the aqueous of the eye. Perhaps they would be about the same as for the venous blood, since the aqueous, after it is once produced in the ciliary body, flows directly into the venous bloodstream via the filtration angle, the canal of Schlemm and the ciliary veins without any intervening membranous barrier. The total gas pressure of the venous blood is 705 mm. or about 55 mm. below that of the atmosphere. The partial pressures all differ from those of the atmosphere; nitrogen is given as 572 mm., oxygen as 40 mm., carbon dioxide 46 mm. and water vapor 47 mm. Consequently, an exchange of gases would take place through the surface of the bubble. The absorption coefficient of carbon dioxide is about 35 times as great as oxygen, which, in turn, is eight or ten times as great as that of nitrogen. As the exchange of gases commences, carbon dioxide would move so rapidly in comparison to oxygen and nitrogen that the latter two may be considered as standing still for the time being in following the steps of the process.

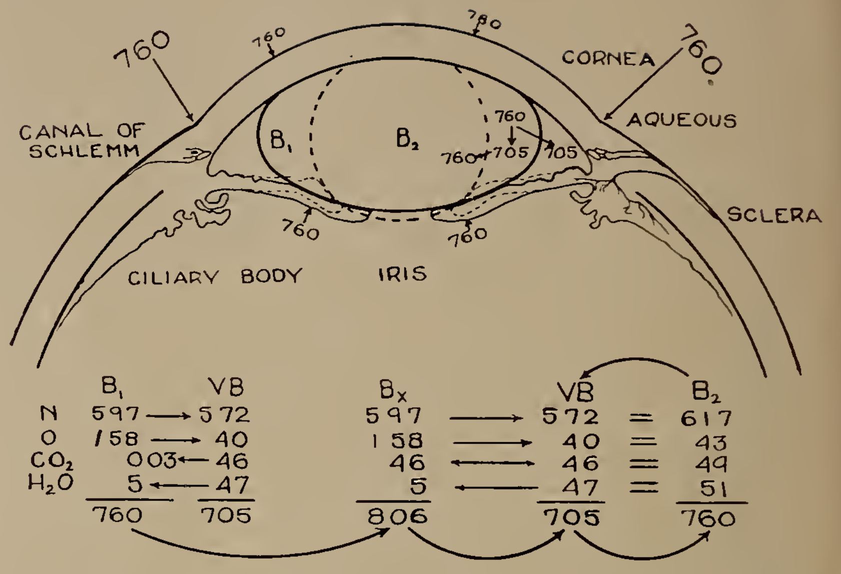


Figure 1.—Absorption of a bubble of air—B_1—from the anterior chamber of the eye. The figures under B_1 indicate the partial pressures of individual gases in air and those under VB the partial pressures of the same gases in venous blood. (For the purposes of this study it is assumed that the values for venous blood and aqueous humor are the same.) Since the diffusion and absorption coefficients of CO_2 are so much greater than those of N and O_2, CO_2 would enter the bubble much more rapidly than the other two would leave, thus increasing the pressure and the volume. Water vapor would also pass into the bubble, seeking equilibrium. Both O_2 and N would be diffusing more slowly, meanwhile, into the lower tensions in the aqueous and eventually all would find equilibrium at those values if the volume remained the same. But, since the summation of the partial pressure is only 705 mm., the volume would not remain the same. Atmospheric pressure, acting upon the yielding cornea and sclera, would decrease the volume until the pressure would again equal 760 mm. This would upset the equilibrium of all the gases and they would again pass into the aqueous, once more causing a shrinkage in volume. Equilibrium would never be attained and the bubble would become entirely absorbed.

Assuming then that the tensions in the aqueous humor are about the same as those in the venous blood, the following steps would occur as far as the air bubble in the anterior chamber is concerned: Carbon dioxide would move rapidly into the bubble until approximate equilibrium was attained. Since the other gases move much more slowly, this would mean that the bubble would increase in pressure or volume or both, thus reducing the partial pressures of all gases. With the exception of water vapor, they would all be greater than the values in the aqueous; therefore, if the volume should remain constant, nitrogen, oxygen and carbon dioxide would all pass into the aqueous until each gas had attained individual equilibrium. If this should happen, then the total pressure would be 705 mm. in the bubble, as well as in the aqueous. However, the volume of the bubble does not remain constant. Due to external pressure of 760 mm. on the yielding, soft structures of the eye (disregarding now, for present purposes, the intraocular pressure), the volume would shrink until a pressure of 760 mm. was again attained in the bubble. This, in turn, would throw all the partial pressures out of equilibrium and all of the gases would once more pass into the aqueous and the process would be repeated. In other words, equilibrium could never be attained until the entire bubble was completely absorbed. As a matter of fact, there would be no distinct steps because all of the processes would occur more or less simultaneously, although at varying rates.

Coryllos and Birnbaum have followed these steps in their work on the alveolus of the lung, but there the condition is different. If atelectasis is developing, there is negative pressure, whereas, on the air in the eye, there is positive pressure.

---

*Since writing this paper, the author injected a measured amount of air, 0.1 cc., into the anterior chamber of an eye on which a cataract extraction had just been completed. The bubble was carefully watched and it was found that four and a half days was required for complete absorption.

Taking another example from the field of otolaryngology, when the ostium of a paranasal sinus becomes obstructed, negative pressure sometimes develops within the sinus (Figure 2). In this case, following the same steps in the physics of gases, carbon dioxide and aqueous vapor would pass into the sinus and oxygen and nitrogen would pass into the venous blood, but, since the walls are rigid, the volume of the gas would not decrease; therefore, theoretically, when the total pressure within the sinus falls to 705 mm., equilibrium would be established, the exchange of gases would be equal in both directions and absorption would cease. It is not possible for the air to be completely absorbed; however, this also is different from conditions in the alveolus of the lung.

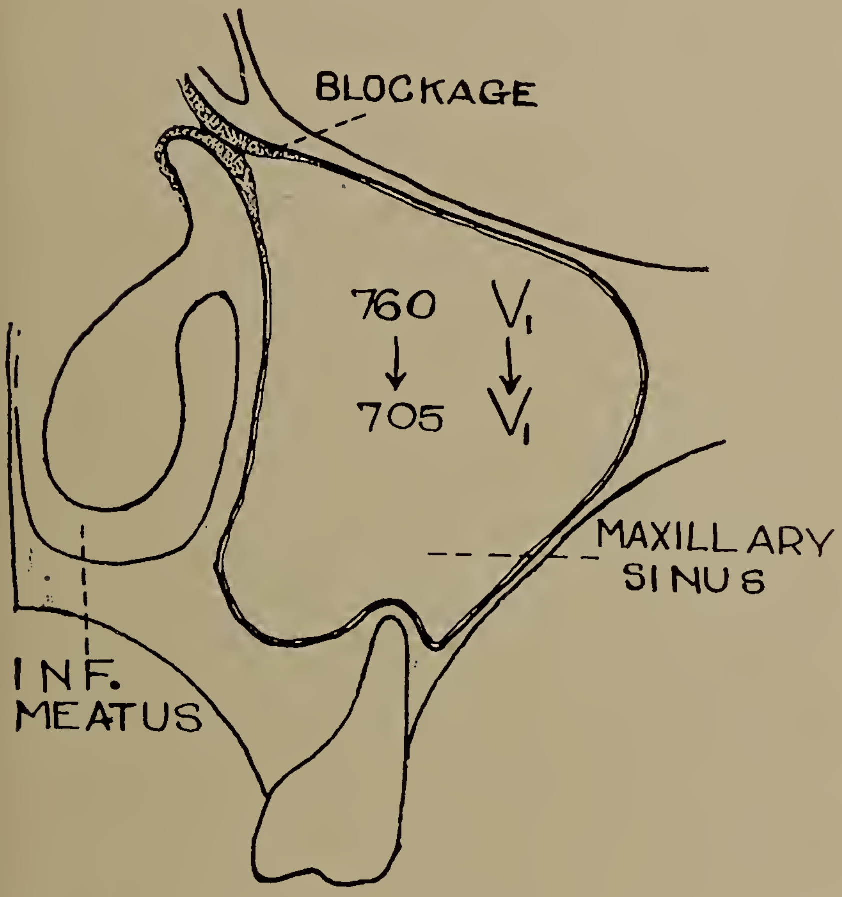


Figure 2.—Absorption of air from an obstructed sinus. Theoretically, the air could never be completely absorbed. When the pressure drops to 705 mm., the gas pressure of venous blood, absorption would cease.

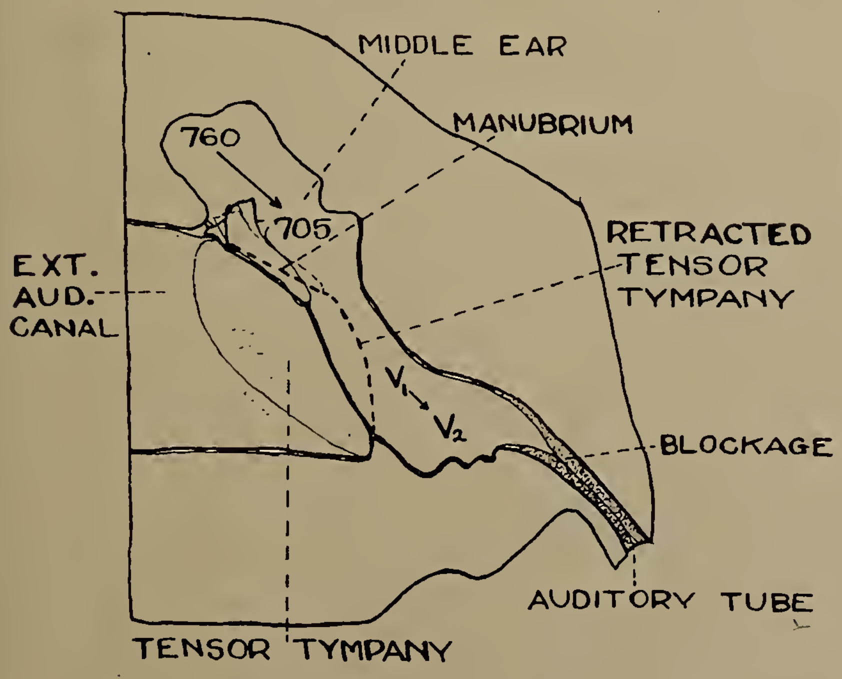


Figure 3.—Absorption of air from the middle ear when the eustachian tube is completely obstructed. Since the tensor tympani is yielding, the volume, as well as the pressure, would be reduced.

As a further illustration, Herbert of Upsala, on introducing rubber balloons into the nasopharynx and inflating them in such a way as to close the eustachian tubes, has found that in about 30 minutes there is pronounced retraction of the ear drum, which he assigns to the reduced pressure following oxygen absorption. (There may be another explanation.) (Figure 3.) Here are conditions midway between those in the eye, where there is an external positive pressure and yielding, soft walls, and those of the sinus, where the walls are rigid and there can be no reduction in volume. That portion of the lateral wall of the middle ear which comprises the tensor tympani is more or less yielding and the volume of the space is reduced somewhat. Therefore, the air in the middle ear would be more completely absorbed than that in the sinus. Still, it is not possible for all of the air to be absorbed; equilibrium would eventually be established.

In the thorax, too, the tissues about the obstructed lobe are not free to yield as completely as those about the bubble in the eye (Figure 4). The wall of the thorax is more or less rigid and negative pressure develops within it. However, absorption can go on until the negative pressure equals the difference between the gas pressures in the alveolus and the gas pressures in the venous blood. This difference approximates 55 mm. of mercury. Theoretically then, there could be established a negative pressure of 55 mm. of mercury before equilibrium would be established and the absorption of gases would cease. The greatest negative pressure which has been measured in collapse of the lung is about 34 mm. of mercury. This would not be sufficient to stop absorption and establish equilibrium. Unless the negative pressure around the affected lobe exceeds 55 mm., all of the air within the obstucted lobe of the lung could be completely absorbed.

However, a certain amount ot time is required for absorption of gases, even from the lung. Coryllos and Birnbaum report experiments in which individual gases were injected into the pleural cavities of rabbits. The absorption time was six days for air, six days for nitrogen, two hours for oxygen, five minutes for carbon dioxide, four days for hydrogen and four days for helium. In another experiment the same gases were injected into the obstructed lung of a dog (i.e., a portion of the lung had been tied off). Absorption of air took 16 hours, of nitrogen 16 hours, of oxygen 15 minutes, of carbon dioxide four minutes, of hydrogen 18 hours, and of helium 26 hours. As these experiments indicate, nitrogen and air require the same amount of time for absorption. From the lung of the dog, this is about 16 hours. If postoperative atelectasis develops in the course of an hour or two, one would suspect that

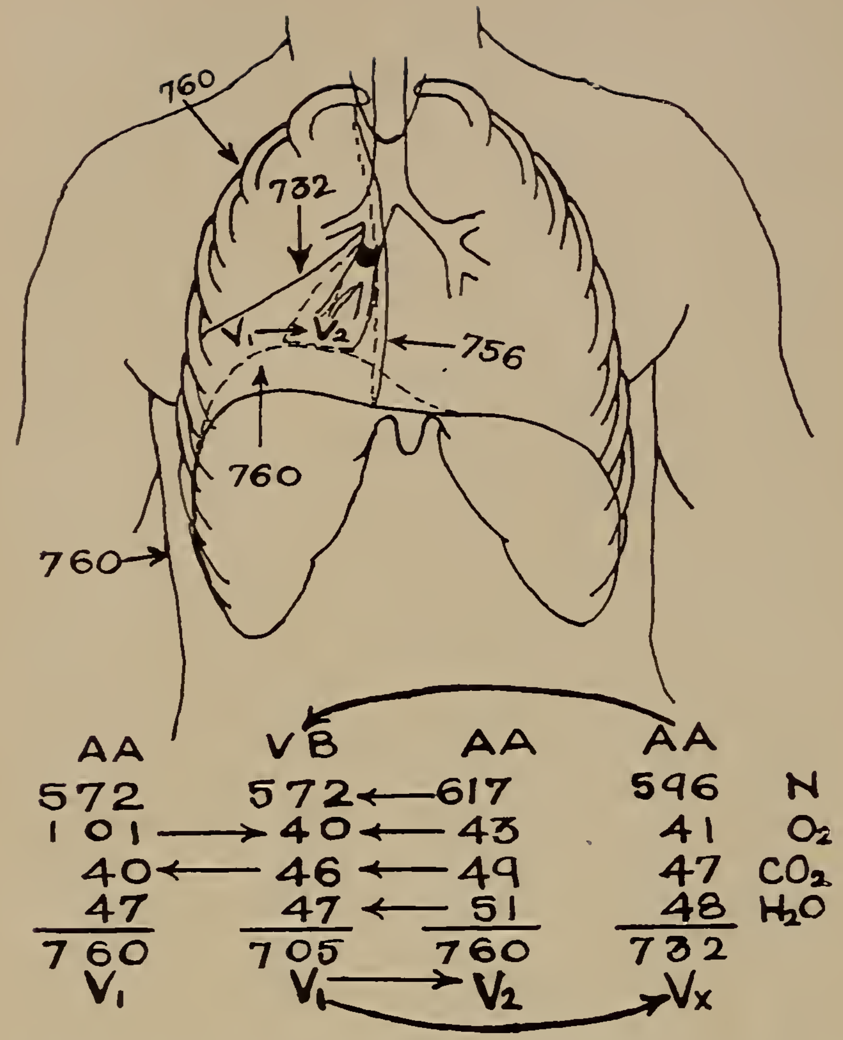


Figure 4.—Absorption of air from an obstructed portion of the lung. The thoracic cage yields somewhat to atmospheric pressure, but not enough to prevent the development of abnormal negative pressure in the presence of massive atelectasis. If the pressure outside the obstructed portion drops to 705 mm. (the gas pressure of venous blood) theoretically absorption would cease. If it remains above this figure, absorption theoretically could be complete.

the air was removed by some means in addition to absorption.

In the literature on postoperative atelectasis, the matter of ciliary action is almost entirely overlooked. It would seem, however, that ciliary action cannot be ignored in the respiratory tract any more than heart action can be disregarded in the circulation, or peristalsis in studying the physiology of the gastrointestinal tract. There is no evidence that the ciliary action in postoperative atelectasis is subnormal.

Some years ago the author carried out experiments to determine the possible relationship of ciliary action to postoperative atelectasis. If the trachea of a freshly killed hen is mounted on a board and respiratory mucus is introduced in the lower end, the ciliary action will carry the mucus through to the upper end in the course of a few minutes. Such an experiment was done, and, as a second step, after placing the mucus in the lower end of the trachea, the lower end was promptly corked and connected with a water manometer. Almost immediately, negative pressure developed. It reached —34 mm. of water in about 18 minutes. This experiment was repeated 18 times, using 19 tracheas in all, with similar results each time. Negative pressure developed behind the moving mass of mucus in a matter of minutes as the latter advanced. The farther the mucus advanced, the greater the negative pressure, and, the greater the negative pressure, the more slowly the mass progressed. Finally it came to a complete stop. The negative pressure recorded was about —40 mm. of water. This simple experiment seems to furnish the key to the development of postoperative atelectasis. The action was essentially that of a piston and cylinder. The mass of mucus, motivated by cilia, acted as a moving piston within the cylindrical piece of trachea. When it came to a standstill, the mucus was not "firmly fixed"; it was simply stalled by atmospheric pressure. The cilia can move large masses of mucus with very little difficulty but they cannot lift fifteen pounds of atmospheric pressure with a piston of slippery mucus. When the pressure in front of the advancing mucus piston, minus the pressure behind it, becomes equal to the effective force which the cilia are able to apply, then the piston of mucus stops.

However, the cilia do not cease their action. In experiments carried on for an hour it was found that the cilia whittled away the volume of the mucous piston at the periphery, carrying it off in thin films to the upper end of the trachea, where it was deposited. As the thickness of the mucous piston became progressively reduced, the negative pressure became progressively less, until eventually, when only a thin film of mucus remained, the pressure on the two sides became about equalized. When this last film broke, the pressure did equalize in the manometer. Sometimes the mucous piston ruptured while still maintaining a considerable pressure. In such cases, the pressure in the manometer dropped suddenly to zero.

Gravity has a pronounced influence on this mechanism. If the board to which the trachea was pinned was picked up and tipped—first laryngeal end down, then laryngeal end up—it was found that the pressure in the manometer fluctuated widely. This might well indicate why changes in position of a patient with atelectasis will sometimes cause a sudden resolution of the process.

It was suggested by associates that the negative pressure produced in the tracheas of these freshly killed hens might still be due to absorption of oxygen by the soft tissues of the trachea. In order to determine the validity of this objection, the trachea was reversed in position and the laryngeal end connected with the manometer. Then, when the mucus was carried through by ciliary action, positive pressure developed. This experiment was repeated four times. The maximum pressure obtained was 55 mm. of water, which would indicate that the phenomenon could not be due to absorption of air or any portion of the gases. No one would seriously argue that the air was absorbed behind the mass of mucus and secreted again in front of it.

Similar experiments were done on the frontal sinus of anesthetized dogs. Two needles were pushed through the scalp and bone into one frontal sinus of a dog; one of these needles was then connected to a water manometer, and, through the other, a small quantity of respiratory mucus was injected (0.3 to 0.7 cc.). In previous studies of the behavior of masses of mucus in the frontal sinus of a dog when the sinuses were open, it had been found that mucus would move by ciliary action up from the depths of the sinus, in a spiral stream, to the ostium, where it would begin to flow out. If a mass 0.2 or 0.3 cc. were dropped into the sinus it would completely occlude the ostium on the way out. In the experiment in question, there was a latent period of a few minutes from the time the mucus was injected before anything happened. Then, presumably, as the mucus entered the ostium and occluded it, thus preventing the return of air as the mucus moved out, negative pressure developed. The maximum negative pressure found in these experiments was —60 mm. of water.

Again the objection was made that this might be due to absorption of the air as the mucus occluded the ostium. Further experiments were done to clarify this question. The experiment was started, as before, and, when the negative pressure had about reached its maximum, the dog was bled to death through the femoral artery. The manometer indicated no appreciable change. The experiment was repeated, the dog being decapitated during the experiment. Again there was no appreciable change indicated on the manometer. To make still more certain that this could not be absorption, a dog was killed, decapitated and the experiment begun on the decapitated head. The result was the same. Negative pressures betwen 40 and 60 mm. of water developed in each instance in the course of ten to twenty minutes.

A report of some of this work was presented before the American Academy of Ophthalmology and Otolaryngology a few years ago. In the discussion that followed, some objected that the negative pressures found were entirely insufficient to explain those present in atelectasis. It was the author's contention that a series of pistons in the longer tubes of man could readily produce a greater negative pressure. Some did not believe that this would happen. Therefore, further experiments were done in which four hen tracheas were laid out end to end and connections made between them, which could be opened or closed at will. Each was then connected to a separate manometer and mucus introduced into the lower end of each. Each manometer then recorded a pressure which was produced by the individual trachea to which it was attached. All were then connected, making virtually one tube with four pistons placed at intervals within it. The pressure in the last manometer promptly began to increase until it equaled approximately the sum of the pressures previously recorded by all four. This experiment was repeated several times and indicated clearly that a series of pistons in tandem will produce a cumulative effect.

To recapitulate briefly, these experiments demonstrated that negative or positive pressure can be produced in the trachea of a freshly killed hen by a piston of mucus moving toward the laryngeal end, motivated by ciliary power. This pressure reaches a maximum in from ten to twenty minutes and may reach a magnitude of from 5 to 40 mm. of water. If several tracheas, with a mucous piston in each, are connected in tandem, the pressure goes much higher since the cumulative effect of all is recorded on the last manometer. Pressure of 150 mm. of water, which is comparable to the pressure found in atelectasis, was obtained in this way. Negative pressure can be produced in the frontal sinus of an anesthetized or new killed and newly decapitated dog by simply injecting 0.2 to 0.7 cc. of respiratory mucus into the sinus. This action is not due to absorption of air but to the ciliary mechanism moving masses of mucus through the ostium while the return flow of air is prevented because the mucus occludes the ostium.

If these findings are applied to what is known about atelectasis, they seem to provide answers to a number of questions left unanswered by the prevalent, accepted theories.

THEORY OF DWINDLING PRESSURE

There is seemingly always an abnormally great quantity of mucus present in atelectasis, and atelectasis does not develop unless there is a sufficient quantity of mucus to occlude the lumen of one or more air passages. The production of mucus is not confined to one mucus piston but it continues over a period of time. It is not only conceivable, but quite probable, that a series of mucinous pistons are carried up the bronchial tree, one after the other, each carrying with it a quantity of air. As the air in the affected lobe is thus reduced, the lobe shrinks but the pressure in it does not become negative, to any extent, until all of the air is removed. When all of the air has been removed, then the final mass of mucus pushed up the air passage by ciliary action becomes stalled and atelectasis is complete. The negative pressure which develops will depend upon the power of the cilia. It can be said that the effective power of the cilia equals atmospheric pressure minus the pressure in the affected lobe. The pumping action of such a series of mucous pistons, motivated by ciliary action, is similar to that in a mercury vacuum pump.

It is not to be inferred that absorption does not play a role. The gases contained in the air in the affected lobe are undoubtedly absorbed at the same time that the pumping of the mucus is going on. The absorption of the various gases would depend upon several factors, among which are the comparative partial pressures in the venous blood and in the alveolar air and the diffusion and absorption rates of the different gases.

Meanwhile, the stalled mucous piston is undoubtedly removed progressively by ciliary action. Given sufficient time the cilia will remove it entirely and permit the flow of air into the lobe, at least if the bronchus in question is held open by cartilaginous rings. However, if production of excessive mucus continues, there will be more mucous pistons produced and these new-formed pistons will maintain the atelectasis.*

The findings here reported lend force to the principles used clinically in the treatment of atelectasis. The mucus is soft and the pistons can often be broken by deep breathing, coughing or change in the patient's position. It may be inferred that conditions must be exactly right before such occluding pistons will form and produce atelectasis. It is easy to derange conditions enough so that the pistons are ruptured and the atelectasis reduced. If the atelectasis cannot be reduced by these procedures, the mucus can be easily aspirated through a bronchoscope.

Medical Arts Building.

REFERENCES

Beecher, H. K.: Measured effect of laparotomy on respiration, J. Clin. Investigation 12:639-650, July 1933.

Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, Baltimore, Williams and Wilkins Co., 1945 (4th ed.), p. 294.

Carlson, A. J., and Luckhardt, A. B.: Studies on the visceral sensory nervous system. III. Lung automatism and lung reflexes in reptilia, Am. J. Physiol., 54:261-306, 1920-1921.

Coryllos, P. N.: Postoperative apneumatosis (atelectasis) and postoperative pneumonia; experimental evidence, J.A.M.A., 93:98-99, July 1929.

Coryllos, P. N., and Birnbaum, G. L.: Bronchial obstruction; its relation to atelectasis, bronchopneumonia and lobar pneumonia; roentgenographic, experimental and clinical study, Am. J. Roentgenol., 22:401-430, Nov. 1929.

Circulation in compressed, atelectatic and pneumonic lung (pneumothorax - apneumatosis - pneumonia), Arch. Surg., 19:1346-1424, Dec. (pt. 2), 1929.

Dripps, R. D., and Deming, M. V.: Postoperative atelectasis and pneumonia; diagnosis, etiology and management based upon 1,240 cases of upper abdominal surgery, Ann. Surg., 124:94-110, July 1946.

Habliston, C. C.: Intrapleural pressures in massive collapse of the lung, Am. J. M. Sc., 176:837, 1928.

Henderson, Y.: The physiology of atelectasis, J.A.M.A., 93:96-98, 1929.

Herbert, C.: Personal communication.

Hilding, A. C., and Hilding, D.: The volume of the bronchial tree at various levels and its possible physiologic significance, Ann. Otol., Rhin. & Laryng., 57:324, June 1948.

Marshall, J. M.: Postoperative pulmonary atelectasis, U.S. Nav. M. Bull., 42:601-606, March 1944.

Schmidt, H. W., Mousel, L. H., and Harrington, S. W.: Postoperative atelectasis; clinical aspects and review of cases, J.A.M.A., 120:859-900, Nov. 1942.

Seybold, Wm. D.: Physiologic disturbances underlying the development of early postoperative atelectasis after lobectomy, Surgical Clinics of North America, 28:871-888, Aug. 1948.

---

* There is another mechanism possible which should be mentioned. If the occluding mucous piston occurs in a membranous bronchus, it is quite possible that the bronchus may collapse behind the piston, due to the negative pressure. If this were to happen, the apposing walls of the bronchus might adhere together because of the cohesiveness of the normal mucous film. In this case, the atelectasis might be maintained without the presence of an abnormally great quantity of mucus.

The Effect of New Drugs on the Rhythmic Function of the Heart

M. H. Nathanson, M.D., and H. Miller, M.D., *Los Angeles*

SUMMARY

Epinephrine and related drugs (sympathomimetic amines) are the only compounds which effectively increase the rhythmic function of the heart.

Effects of two new non-pressor sympathomimetic compounds were observed. One of these compounds, the isopropyl homologue of epinephrine, was found to be about five times more active than epinephrine.

From clinical observations on the action of a new cardiac depressant drug, alpha-fagarine, it was concluded that the drug is very effective but that toxic reactions are unpredictable.

The potency of alpha-fagarine and related compounds suggests the possible development of chemically related non-toxic drugs having an effective cardiac depressant action.

In a discussion of the pharmacologic action of a drug upon the heart, it is important to specify the particular property of the heart that is under consideration. The heart is a contractile organ but it possesses essential functions in addition to contractility — rhythmicity, conductivity, irritability, and tonicity.

The heart, being an automatic organ, produces its own stimulus for contraction. The property of stimulus formation is termed rhythmicity or automaticity. Normally, the sinus node possesses this property in the highest degree, and performs the pacemaking function of the heart. However, potential rhythmic foci exist in other portions of the heart. A recognition of the importance of cardiac rhythmicity is essential to the clinician, since abnormalities of this function may result in profound disturbances in cardiac activity and form the basis for a variety of clinical manifestations. Absence of an impulse-initiating mechanism is the basis for the cardiac syncope associated with a hyperactive carotid sinus reflex and for the ventricular standstill of heart block. On the other hand, an increase in rhythmic activity in certain portions of the heart leads to the development of ectopic rhythms and is related to the most serious arrhythmia, ventricular fibrillation, which is generally accepted as the mechanism of sudden cardiac death.

It is evident that while a disturbance in contractile efficiency is the basis for the relatively slow-developing congestive failure, sudden cessation of cardiac activity (cardiac syncope or sudden cardiac death) is the result of a disturbance in its rhythmic function.[6] Drugs which increase or decrease the rhythmic property of the heart are therefore of importance in cardiac therapy. The present report deals with recent studies and developments in (a) drugs which stimulate the pacemaking function of the heart (cardiac stimulant drugs) and (b) drugs which tend to inhibit ectopic rhythms, including auricular and ventricular fibrillation (cardiac depressant and antifibrillatory drugs).

CARDIAC STIMULATING DRUGS

In previous reports, a method was described and utilized for the study of the stimulant action of drugs on the human heart.[7, 8] The method depends on the fact that it is possible in many individuals, especially elderly males, to produce consistently a cardiac standstill by compression of the carotid sinus. After the administration of various unrelated drugs including digitalis, caffeine, Coramine® (nikethamide), Metrazol® (pentamethylenetetrazole), barium chloride, calcium gluconate and thyroxin, the cardiac standstill could be consistently reproduced, indicating that these compounds were ineffective in stimulating the rhythmic property of the heart. It was found that epinephrine consistently abolished the standstill by stimulating the normal pacemaker or by initiating new rhythmic foci. A considerable number of epinephrine-like compounds (sympathomimetic amines) were studied and found to possess this action with varying degrees of intensity (Table 1). The results of these studies seemed

Table 1.—*Comparative Activities on Cardiac Standstill of Ephinephrine-like Compounds*

Drug	Approximate Ratio of Activity to Eprinephrine
Cobefrine®	1:10
Epinine®	1:40
Kephrine®	1:40
Neosynephrine®	1:100
Synephrine®	1:400
Paredrine®	1:500
Tyramine	1:1200
Ephedrine	1:1500
Phenylethanolamine	1:8000
Pyrocatechol	Inactive

Presented as part of a Symposium on Heart Disorders arranged jointly by the Section on General Medicine and the California Heart Association at the 78th Annual Session of the California Medical Association, May 8-11, 1949, Los Angeles.

to justify the conclusion that an increase in cardiac rhythmicity is the result of a specific pharmacodynamic action, stimulation of the cardiac accelerator mechanism. It would be anticipated that any drug related structurally to epinephrine and possessing a sympathomimetic action should have a cardiac stimulant action.

Recently two new compounds, related in structure to epinephrine, have been introduced for the treatment of asthma. These compounds are 1-(3, 4,-dihydroxyphenyl)-2-amino-1-butanol, known as Butanephrine,® and 1-(3, 4,-dihydroxyphenyl)-2-isopropylaminoethanol, known as Isuprel.® The pharmacological properties of Butanephrine have been described by Tainter and his associates[11] and those of Isuprel by Lands and his group.[5] Although the effects of these compounds are in general similar to those of epinephrine, they differ in one important respect: They do not possess a pressor action, showing usually a moderate depressor effect. Since a cardiac stimulant drug might be required in patients who have hypertension, it seemed that the study of a non-pressor compound on the rhythmic function of the heart might be of practical interest.

PROCEDURE

The technique was similar to that used in previous studies.[7] The subjects selected were those in whom cardiac standstill could be consistently induced by carotid sinus pressure. An electrocardiogram was first made showing the induced cardiac standstill. A blood pressure reading was also taken at this time. The drug was then administered and the effect of carotid sinus compression recorded after suitable intervals. Blood pressure readings were also recorded at these periods. Butanephrine was administered intravenously to 12 subjects in doses of 0.5 mg. to 0.8 mg. The effect of the drug was observed at intervals of from one to three minutes after the administration of the drug. Isuprel was administered subcutaneously to 14 patients in whom cardiac standstill could be induced. The dose varied from 0.14 mg. to 0.2 mg. Electrocardiograms showing the effect of carotid sinus pressure were made, and blood pressure readings recorded starting two minutes after the administration of Isuprel and thereafter at two-minute intervals.

RESULTS

The cardiac inhibition induced by carotid sinus pressure was modified in every instance following the administration of both compounds (Figures 1, 2, 3, 4). The standstill was abolished by the restoration of the sinus pacemaker or by the initiation of ectopic auricular or ventricular rhythmic foci. Frequently multiple rhythmic foci were induced by both drugs. Sinus tachycardia usually followed the administration of both compounds. The onset of the effect was usually within one minute after the intravenous injection of Butanephrine and within five minutes after the subcutaneous administration of Isuprel. The patients were consistently aware of the increase in cardiac activity. This effect was of relatively short duration following Butanephrine but lasted up to 20 minutes after the administration of Isuprel. Butanephrine produced a lowering of the diastolic pressure in each instance. The systolic pressure was unchanged or slightly elevated. In one case, there was a definite elevation of the systolic pressure of short duration. The blood pressure response after Isuprel was as follows: The diastolic pressure was depressed in every instance; the systolic pressure was unchanged in six instances, slightly elevated in four and slightly depressed in four experiments.

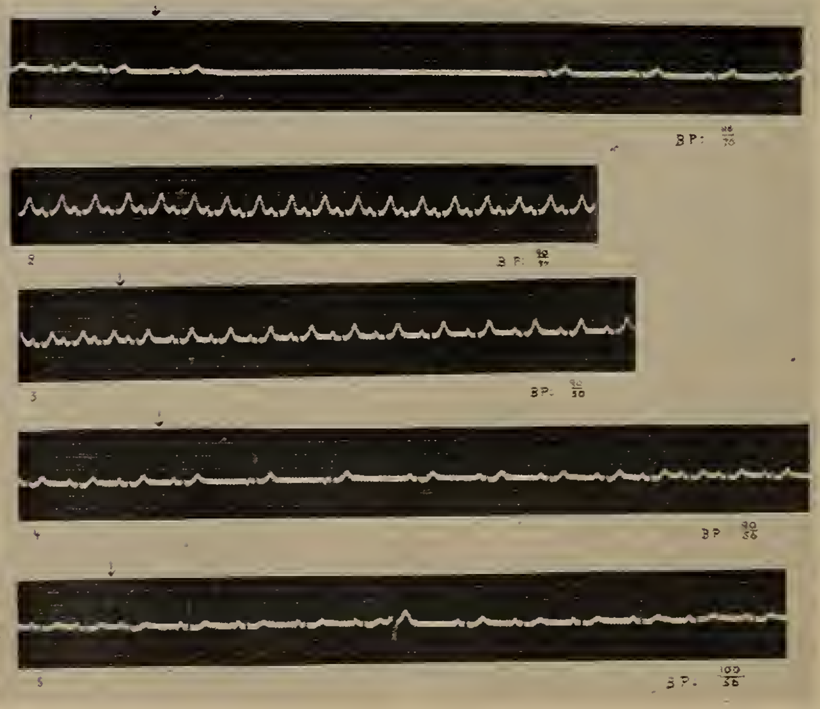


Figure 1.—Strip 1 shows cardiac standstill of 5.8 seconds duration, induced by pressure on the right carotid sinus (arrow). Strip 2, taken 1 minute after the intravenous injection of 0.6 mg. of butanephrine, showing pronounced sinus tachycardia with elevation of the T wave. Strips 3, 4, and 5, taken at 2, 5, and 8 minutes after the drug injection, show the carotid sinus pressure (arrow) fails to produce a standstill due to the development of beats arising from the sinus node, from lower auricular foci (Strip 4) and from a lower ventricular focus (Strip 5). There is a lowering of both systolic and diastolic pressures.

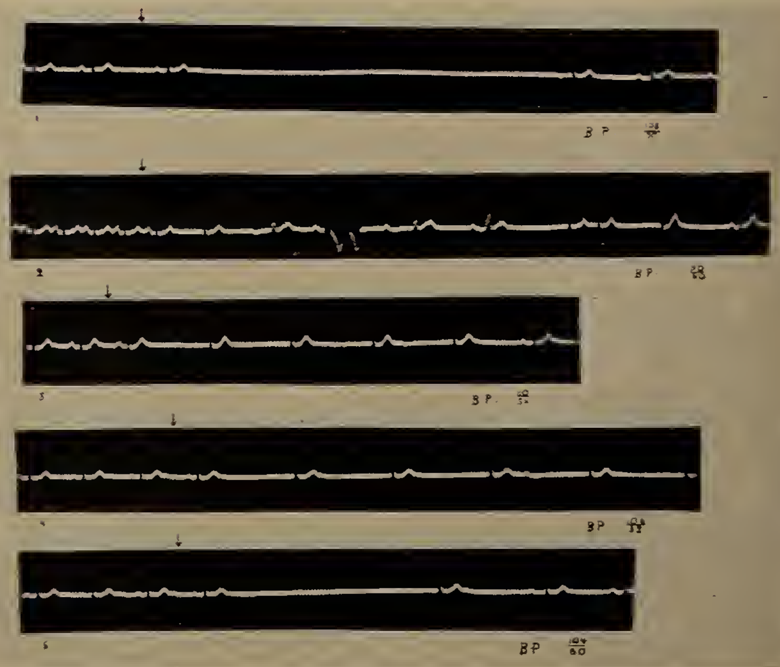


Figure 2.—Strip 1 shows cardiac standstill of 6.8 seconds duration, induced by pressure on the right carotid sinus (arrow). Strip 2, taken 1 minute after the intravenous injection of 0.8 mg. of butanephrine. Carotid sinus pressure does not induce a standstill, due to the development of beats of nodal and ectopic ventricular origin. Strips 3 and 4, taken 3 and 5 minutes after the injection of the drug, show the abolition of the standstill by beats of nodal origin. Strip 5, taken 7 minutes after the butanephrine, shows the induction of a cardiac standstill of short duration.

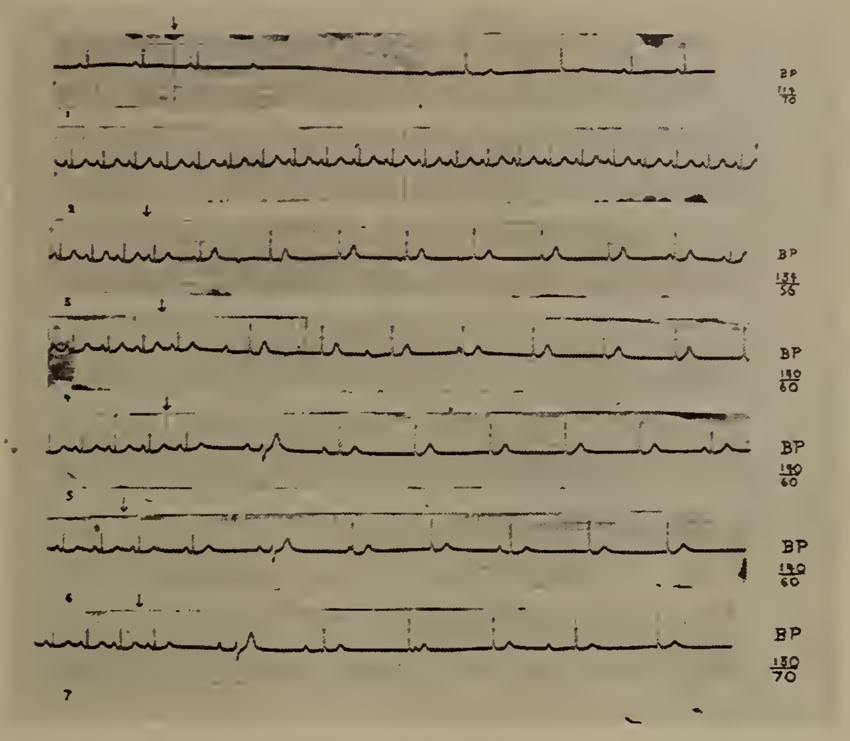


Figure 3.—Strip 1 shows ventricular standstill of 5 seconds duration induced by pressure on the right carotid sinus (arrow). Strip 2, taken 5 minutes after the subcutaneous injection of 0.18 mg. of Isuprel, shows a sinus tachycardia and pronounced elevation of the T wave. Strips 3, 4, 5, 6 and 7, taken 5, 10, 20, 25 and 30 minutes after Isuprel injection. Carotid sinus pressure fails to induce a standstill due to the development of beats of nodal origin and occasional beats arising from a lower ventricular focus (strips 4, 5, and 6).

In order to further study the activity of these compounds on the rhythmic property of the heart, a study was made of their effect on the ventricular rate in complete heart block. Butanephrine 0.8 mg. was administered intravenously to two patients with this condition. In one patient, the ventricular rate was increased from 33 to 43 beats (Figure 5) per minute, and in the other from 32 to 50. Isuprel was administered subcutaneously to six patients with complete heart block. The dose was 0.2 mg. in five patients and 0.1 mg. in one case. There was an increase in the ventricular rate ranging from 9 to 29 beats per minute. In four patients, a comparison was made of the effects of 1 mg. of epinephrine and 0.2 mg. of Isuprel. In each instance there was a more pronounced increase in the ventricular rate following the smaller dose of Isuprel (Figure 6). These results indicate an activity of Isuprel which is at least five times that of epinephrine.

DISCUSSION

As a result of these studies, two new compounds are available which increase cardiac rhythmicity. The absence of a pressor action may be of some practical value in therapy in conditions in which cardiac standstill may occur and in which hyper-

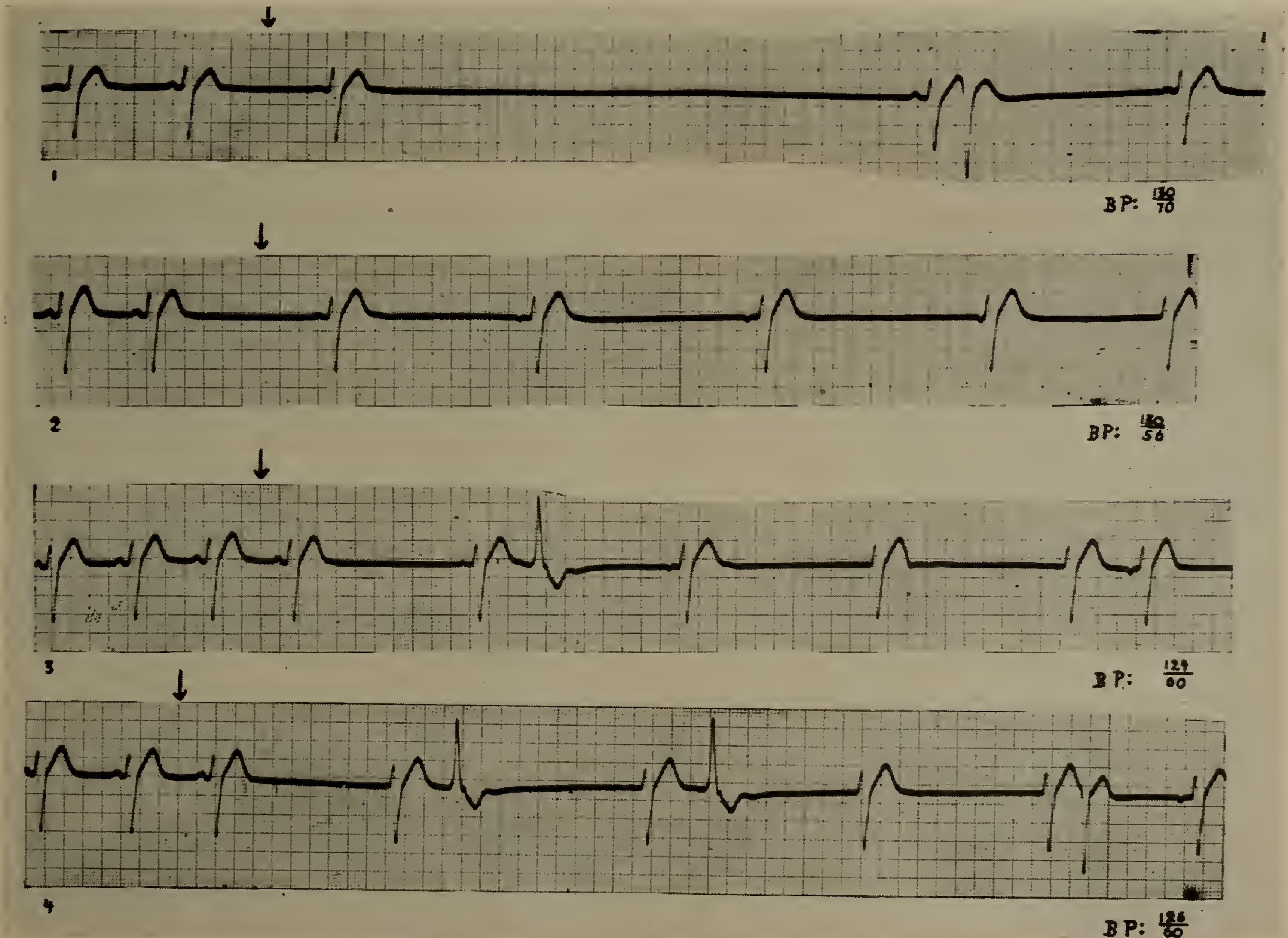


Figure 4.—Strip 1 shows cardiac standstill of 6.4 seconds duration induced by right carotid sinus pressure (arrow). Strips 2, 3 and 4, taken 7, 10 and 15 minutes after the subcutaneous injection of 0.15 mg. of Isuprel, show failure of carotid sinus pressure to induce standstill due to the development of beats of nodal and lower ventricular origin.

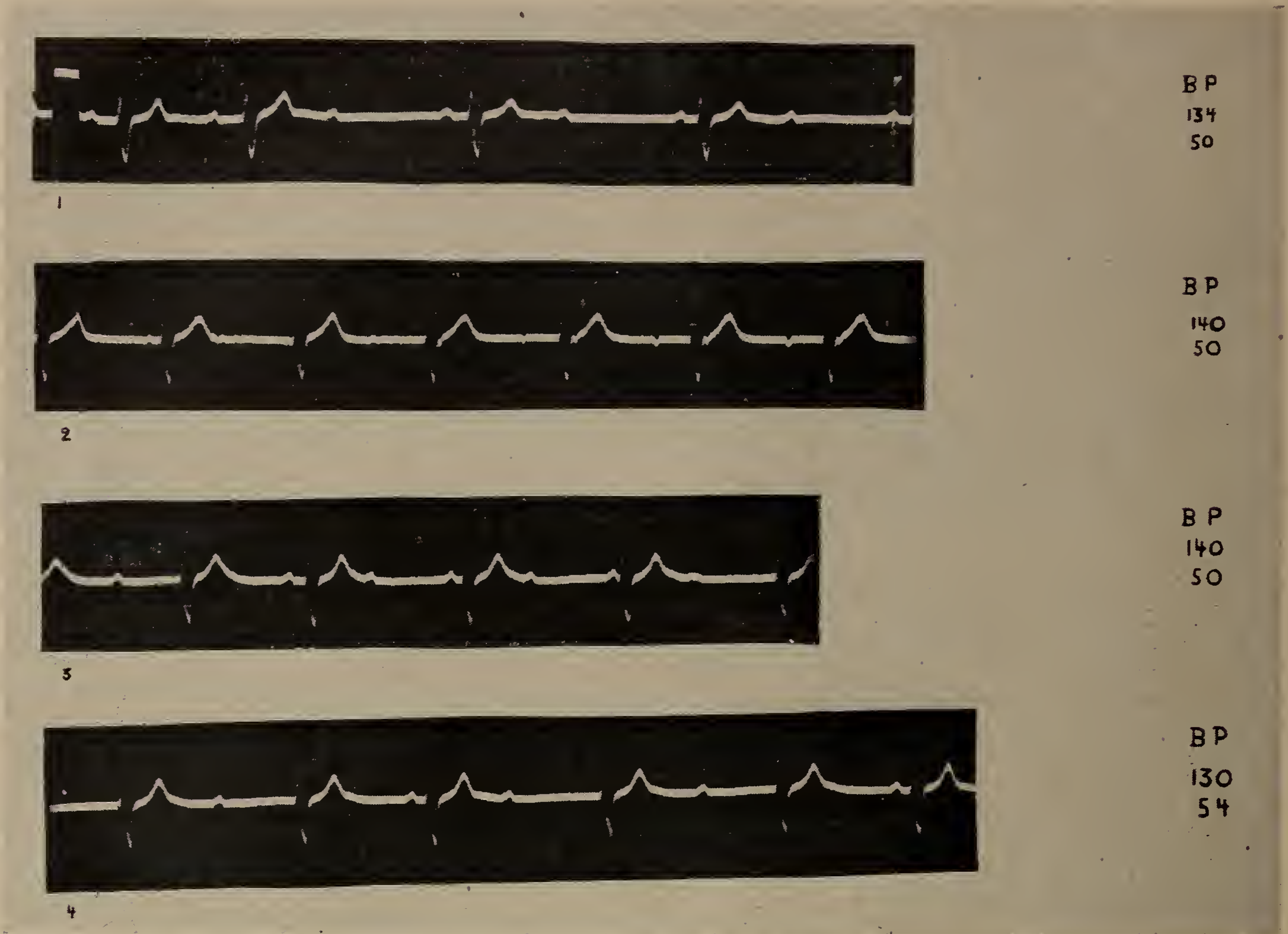


Figure 5.—Strip 1 shows complete heart block, ventricular rate 32. Strips 2, 3 and 4, were taken 2, 3 and 5 minutes after the intravenous injection of 0.8 mg. of butanephrine. In strip 2, ventricular rate is 50, in strip 3 it is 42 and in strip 4, it is 38.

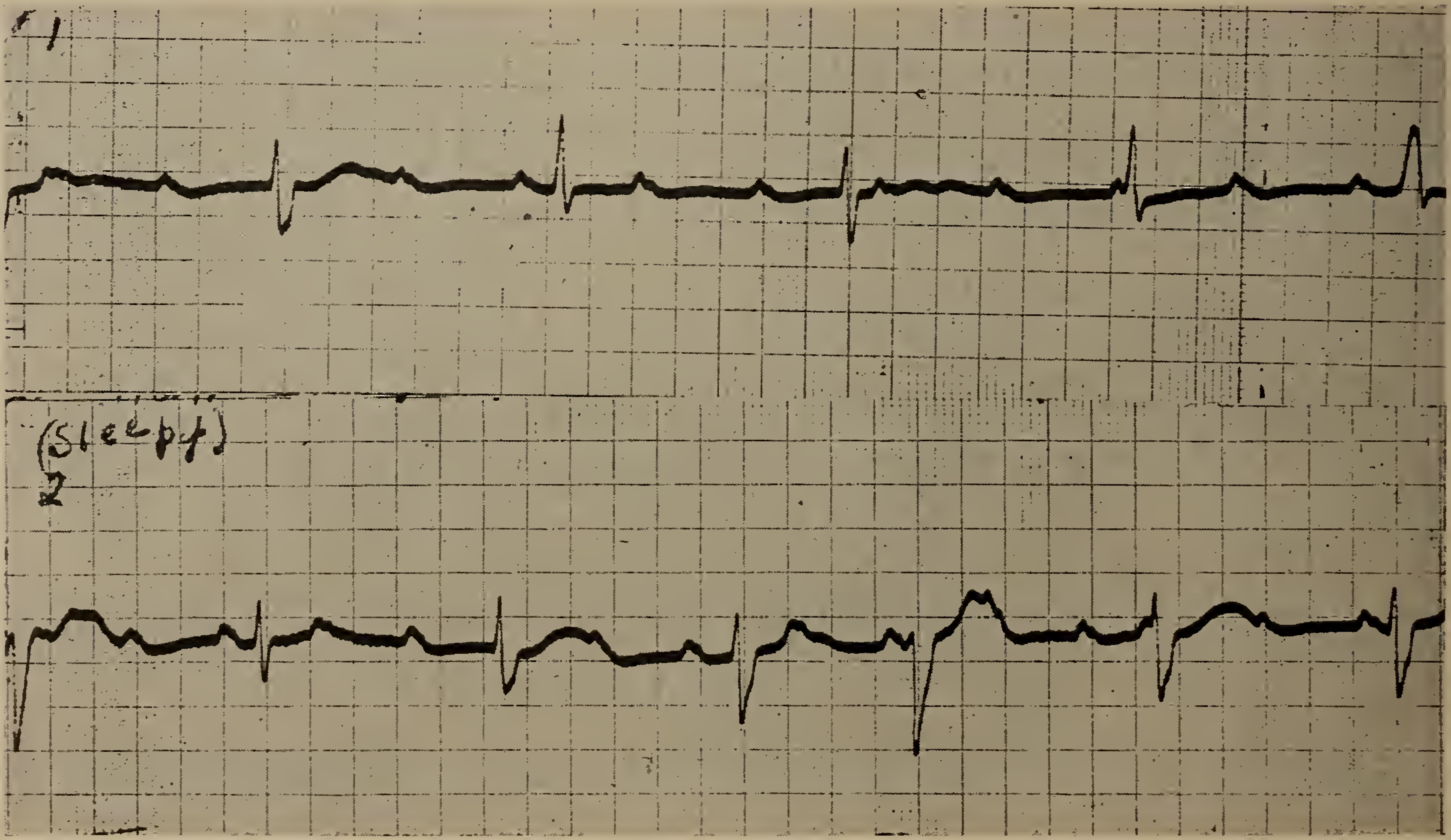


Figure 6.—Upper strip shows complete heart block, ventricular rate 46. Lower strip, taken 30 minutes after the subcutaneous injection of 0.2 mg. of Isuprel, shows a ventricular rate of 65. The maximum increase in ventricular rate following 0.2 mg. of Isuprel was 25 beats per minute. In this patient the maximum increase in ventricular rate following 1 mg. of epinephrine was 7 beats.

tension is present. These results also demonstrate that a pressor action is not essential for a drug to increase the rhythmic function of the heart. Of special interest is the great activity of Isuprel, which appears to show a potency about five times greater than that of epinephrine. This is the first compound shown to have cardiac stimulating activity greatly superior to that of epinephrine. The potency and the absence of pressor action suggest that this drug may replace epinephrine in the prevention and therapy of cardiac standstill.

There is possibly another particularly important advantage of Isuprel as compared with epinephrine. It is well known that the administration of epinephrine carries a possible hazard. The increase in cardiac rhythmicity following epinephrine induces a tendency to ventricular fibrillation, and in some instances ventricular fibrillation has occurred after the administration of epinephrine in the treatment of cardiac standstill. The sudden cardiac failure which occurs in heart block and during surgical operations may be due to either cardiac standstill or ventricular fibrillation. It is often impossible to ascertain which mechanism is responsible for the sudden cessation of effective cardiac action. If transient ventricular fibrillation is the underlying mechanism, the administration of epinephrine would tend to perpetuate this arrhythmia, possibly leading to a fatal outcome. The recent report of Garb and Chenoweth[4] indicates that Isuprel differs greatly from epinephrine in the induction of ventricular fibrillation. These observers produced ventricular fibrillation consistently in cats during hydrocarbon inhalation by the administration of epinephrine, while Isuprel given under such conditions did not induce this arrhythmia. The hazard of the administration of a sympathomimetic compound in the therapy of sudden cessation of cardiac activity is greatly lessened by the availability of a potent drug which does not dispose to ventricular fibrillation.

CARDIAC DEPRESSANT DRUGS

It is clear from the preceding discussion that a large number of chemically related compounds are available for the purpose of stimulating the rhythmic function of the heart. Modifications in the basic chemical structure influence the potency, stability and the relative cardiac and pressor actions of these drugs. In contrast to this favorable situation, there has been little progress in the development of drugs which are cardiac depressants and which have an inhibiting action on ectopic rhythms. Until recently, it has not been possible to correlate any particular chemical structure with a cardiac depressant action. Quinidine has had the longest and widest usage as a cardiac depressant drug. Although this compound has been a great addition in cardiac therapy, it is not consistently effective and frequently fails when a depressant action is most desirable. Atabrine and papaverine are also not sufficiently reliable in their action. It is evident that further studies are necessary on drugs which may possess a "quinidine-like" action.

Recently a group of Argentine workers reported on the quinidine-like action of alpha-fagarine, an alkaloid isolated from the Argentine plant *Fagara Coco.*[2] This report included the results of the effects of the drug in six patients observed by Taquini. The drug was administered intramuscularly in a single dose of 60 mg. to 100 mg. to four patients with auricular fibrillation and to two with auricular flutter. Normal sinus rhythm was established in each case within 30 minutes. In all but one, quinidine administered in the usual dose had failed. In a later report, Taquini[12] administered alpha-fagarine to 25 normal individuals. The drug was given alone in some instances, after atropine in others, and after complete digitalization in still others. Electrocardiograms showed a prolongation of the Q-T interval in all cases and this was more pronounced when the drug was given after digitalization. No toxic symptoms were noted.

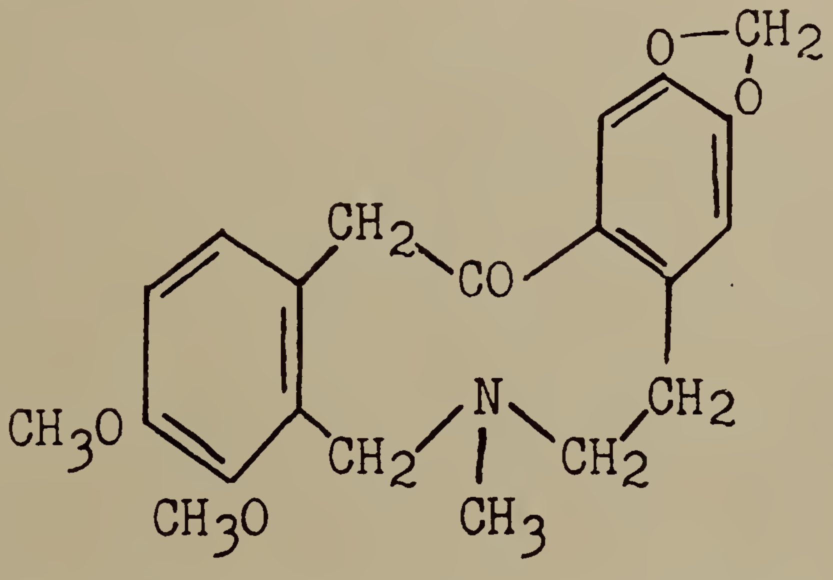


Figure 7.—Structural formula of alpha-allocryptopine (alpha-fagarine).

Redemann, Wisegarver and Alles[9] showed that alpha-fagarine was identical with the previously known alkaloid alpha-allocryptopine which has the structure shown in Figure 7. This compound is closely related chemically to cryptopine and protopine, two of the lesser alkaloids long known to be present in opium. Alles and Ellis[1] showed that several compounds related chemically to alpha-fagarine had a similar depressant cardiac action.

The following is a brief summary of the results of the administration of alpha-fagarine* in five patients:

In two patients with frequent ventricular extrasystoles, there was a pronounced reduction in the frequency of the ectopic beats after the administration of alpha-fagarine by mouth in 100 mg. doses twice a day. There were no untoward reactions.

The third patient was a woman 59 years of age who complained of frequent attacks of palpitation over a period of six months. In the week prior to the initial examination, consciousness of a rapid heart had been present almost constantly. The tachycardia was present during the day and disturbed

---

* A supply of the drug was made available by Dr. Gordon Alles of Pasadena.

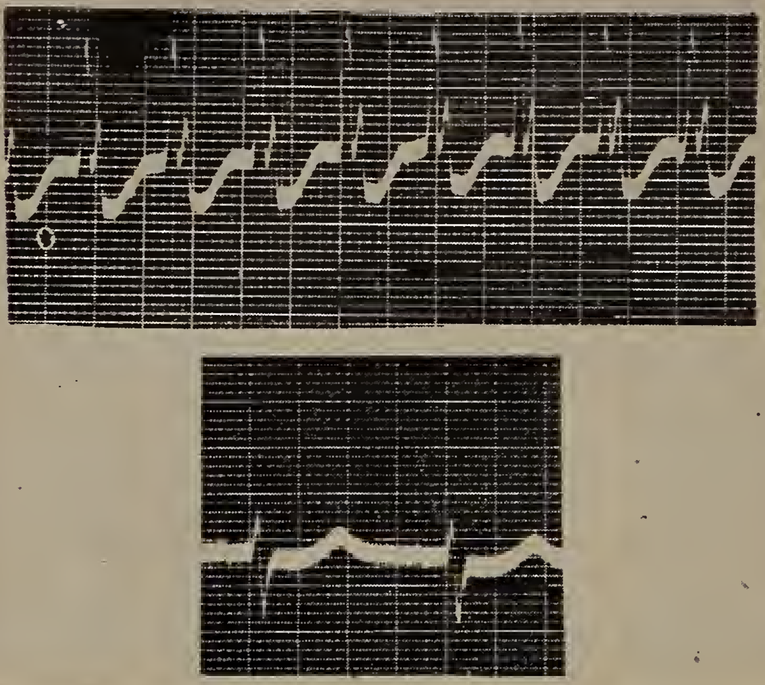


Figure 8.—Upper strip shows ventricular tachycardia, rate 168. Lower strip, taken 30 minutes after the oral administration of 50 mg. of alpha-fagarine, shows a sinus rhythm, rate 76.

sleep during the night. On physical examination the chief abnormality noted was a heart rate of 150 beats per minute. An electrocardiogram showed that this was due to ventricular tachycardia. This was not influenced by carotid sinus pressure. The patient received alpha-fagarine, 100 mg., orally. An electrocardiogram taken one hour later showed a rate of 84 with sinus beats and occasional ventricular extrasystoles. Four hours later another 100 mg. of alpha-fagarine was administered. Thirty minutes after the second dose the patient complained of severe head noises which persisted for about two hours. During the night she was free of the tachycardia for the first time in a week. She was informed the head noises were probably due to the drug; however, because of a return of tachycardia, she desired to try another dose of the drug on the following day. One hour after 100 mg. of alpha-fagarine was given, tachycardia had subsided but there was a recurrence of head noises. The drug was then discontinued. Four days later quinidine sulfate was administered in doses of 200 mg. three times a day. The tachycardia was unaffected but the head noises recurred following the second dose of quinidine. The similarity of the toxic effect following both drugs is of interest. Alpha-fagarine and quinidine are entirely unlike in chemical structure with the exception that both compounds contain a methoxy group. These observations suggest that this toxic reaction of alpha-fagarine and quinidine may be attributed to the methoxy grouping in the molecule.

A fourth patient,† a male 50 years of age, had a severe attack of chest pain on August 1, 1948. The electrocardiogram was characteristic of posterior myocardial infarction. On August 4 and 5 there were several attacks of acute dyspnea and occasional ventricular extrasystoles were noted. The patient was digitalized with digitoxin and then placed on digitalis leaf, 0.1 gm. a day, as a maintenance dose. Because of the extrasystoles, quinidine was also administered and the dose increased to 400 mg. every four hours. This therapy did not eliminate the ectopic beats and on August 19 an electrocardiogram showed frequent multifocal extrasystoles and occasional paroxysms of ventricular tachycardia. The digitalis and quinidine were discontinued and for a time the heart rhythm became regular. During the night of August 21, ventricular tachycardia developed. The rate was 168 per minute (Figure 8). Alpha-fagarine was administered in 50 mg. doses by mouth at 2 p.m., 4 p.m. and 10 p.m., and thereafter three times a day. Tachycardia ceased 30 minutes after the first dose and there was considerable subjective improvement. On August 24 occasional extrasystoles appeared and quinidine sulfate, 200 mg. three times a day, was added to the treatment. On August 26, the patient received a dose of quinidine at 3 p.m. and alpha-fagarine at 7 p.m. He suddenly complained of dizziness at 7:50 p.m., became dyspneic, and died at 7:55 p.m.

The fifth patient‡ was a woman 36 years of age who had long-standing and advanced rheumatic heart disease of the aortic and mitral valves associated with auricular flutter. There was no change in the rhythm following the administration of quinidine in amounts up to 3 gm. in divided doses. The patient was then digitalized and a slowing of the ventricular rate followed. On August 5, 1948, 100 mg. of alpha-fagarine was given by mouth at 9:30 in the morning. One hour later the patient became very dizzy and there was a buzzing in the ears. Two hours after the administration of the drug, the heart rhythm was regular and the rate was 88 beats per minute. An electrocardiogram taken 30 minutes later showed a 2-to-1 heart block and a bigemini consisting of ventricular extrasystoles (Figure 9b). A record taken after 15 minutes showed regular sinus rhythm, with the rate 94 per minute (Figure 9c). There were periods of apparently total irregularity and another electrocardiogram was made after an interval of 15 minutes (Figure 9d). This showed a rhythm consisting predominantly of multifocal ectopic ventricular beats. At other times the rhythm appeared regular as shown in the record taken 20 minutes later (Figure 9e). The final record, taken four hours after the administration of alpha-fagarine, showed auriculoventricular dissociation and frequent ectopic ventricular beats (Figure 9f). Two hours later the patient was apparently in good condition when she suddenly became extremely cyanotic and died.

Recently Scherf and his associates [10] published the results of the administration of alpha-fagarine in 13 patients. In five cases dangerous multifocal ventricular extrasystoles were observed following the administration of the drug. As similar reaction was observed in the fifth patient and possibly the fourth in the series reported by the authors in preceding paragraphs, it seemed that further clinical trial of the drug was not justified. It is still possible that in some

---

† Clinical data supplied by Dr. Archer J. Sokol.

‡ Clinical data supplied by Dr. Eugene Levine.

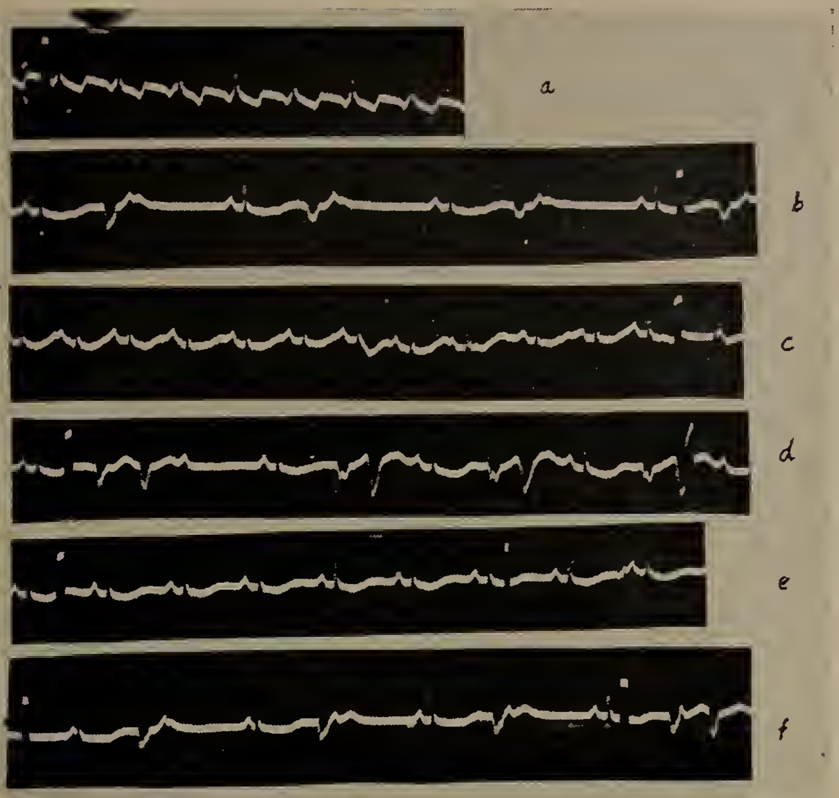


Figure 9.—Strip "a" shows auricular flutter with a 2 to 1 block. Strip "b," taken 2½ hours after the oral administration of 100 mg. of alpha-fagarine, shows a 2 to 1 auriculoventricular block and sinus beats alternating with ventricular extrasystoles. Strip "c," taken 15 minutes after strip "b," shows a sinus rhythm. Strip "d," taken 3 hours after administration of alpha-fagarine, shows occasional sinus beats and many multifocal ectopic ventricular beats. Strip "e," taken 20 minutes later, shows a sinus rhythm Strip "f," taken 4 hours after the administration of alpha-fagarine, shows sinus beats and frequent ectopic ventricular beats.

circumstances a trial of the drug is justifiable. In instances of prolonged ventricular tachycardia in which there has been no response to other measures and in which a serious outcome seems probable, the risk of the administration of alpha-fagarine may be definitely less than the hazard of the condition. However, the most important contribution of the introduction of this drug is the indication that there may be a common relationship between the chemical structure and the action of cardiac depressant drugs. An examination of the chemical structures of quinidine, atabrine, papaverine, and alpha-fagarine shows that although there are considerable differences in chemical structure in these compounds, they all contain a common chemical group, a (CH_3O) methoxy group (Figure 7). Recently the importance of this group in anti-fibrillatory compounds has been pointed out by Di Palma and Lambert.[3] This suggests that the study of a group of chemically related compounds may provide important leads relative to the basic chemical structure necessary for optimum cardiac depressant action. Work along these lines is going on in several laboratories.

6333 Wilshire Boulevard.

REFERENCES

1. Alles, G. A., and Ellis, C. H.: Comparative actions of certain compounds like alpha-fagarine, J. Pharmacol. and Exper. Therap., 94:416, Dec. 1948.

2. Deulofeu, V., Labriola, R., Oreas, O., Moisset de Espanés, E., and Taquini, A. C.: Fagarine, a possible substitute for quinidine, Science, 102:69, July 20, 1945.

3. Di Palma, J. B., and Lambert, J. J.: Importance of the methoxy group in antifibrillatory compounds, Science, 107:66, Jan. 16, 1948.

4. Garb, S., and Chenoweth, M. B.: Studies on hydrocarbon-epinephrine induced ventricular fibrillation, J. Pharmacol. and Exper. Therap., 94:12, Sept. 1948.

5. Lands, A. M., Nash, V. L., McCarthy, H. M., Granger, H. R., and Dertinger, B. L.: The pharmacology of N-alkyl homologues of epinephrine, J. Pharmacol. and Exper. Therap., 90:110, June 1947.

6. Nathanson, M. H.: Rhythmic property of the human heart, Arch. Int. Med., 27:613, Nov. 1943.

7. Nathanson, M. H.: Effect of drugs on cardiac standstill induced by pressure on the carotid sinus, Arch. Int. Med., 51:387, March 1933.

8. Nathanson, M. H.: Further observations on the effect of drugs on induced cardiac standstill, Arch. Int. Med., 54:111, July 1934.

9. Redemann, C. E., Wisegarver, B. B., and Alles, G. A.: Characterization of certain alkaloids from Fagara coco, J. Am. Chem. Soc., 71:1030, 1949.

10. Scherf, D., Silver, A. M., and Weinberg, L. D.: Clinical observations with fagarine, Ann. Int. Med., 30:100, Jan. 1949.

11. Tainter, M. L., Cameron, W. M., Whitsell, J. J., and Hartman, M. M.: Clinical actions of ethylnorsuprarenin, J. Pharmacol. and Exper. Therap., 81:269, July 1944.

12. Taquini, A. C.: Fagarine—A new drug for the treatment of auricular fibrillation and flutter, Am. Heart J., 33:719, May 1947.

Surgical Emergencies

FELIX R. ROSSI, JR., M.D., *Fairfield*

SUMMARY

Action according to preconceived plans may be life-saving at the scene of accidents involving serious injury to several persons. Severe hemorrhage and respiratory obstruction must be dealt with immediately. As the latter may not be apparent at a glance, it should be looked for specifically. Artificial respiration may be necessary. Spinal puncture is a procedure in first aid which should be carried out at the site of an accident if there are symptoms of cerebral edema or of increased cerebral pressure.

Routine plans should be laid to meet the emergency of cardiac arrest on the operating table. The surgeon must be prepared to begin cardiac massage within three minutes in such instances.

SURGICAL emergencies can be divided grossly into two general classes: Those requiring relatively quick and decisive action to save a life, and those that call for no particular immediate action and allow sufficient time for transportation of the patient, careful diagnostic procedures and surgical preparation. The former are the subject of this presentation.

Surgically speaking, there are, fortunately, only a few conditions which can snuff out a life in a short time. These are asphyxia, hemorrhage, increased intracranial pressure, injury high in the spinal cord, cardiac arrest at the operating table, and shock.

Before taking up some of the specific clinical entities, it is well to consider first the proper approach to an accident involving several people who have sustained multiple, serious injuries. This picture arises, generally, at the scene of an automobile or train accident, explosion, fire, earthquake or similar major disaster. At first sight, the problem may seem almost hopeless—so much to be done and so little time to do it. In the confusion and excitement and amidst the entreaties of anxious relatives and friends, much valuable time can be lost unless the physician is guided by a routine pattern of action. The definitely dead and obviously uninjured are passed aside and attention directed immediately to the living but injured. First, a rapid survey is made for severe hemorrhage and for respiratory embarrassment. Hemorrhage is checked by tourniquet, direct pressure, or hemostats if any are available. If sterile bandages are available, wound contamination may be prevented. The physician at the scene should inspect for and establish a free air passage in unconscious individuals, and initiate artificial respiration if this is indicated. Next comes the treatment for shock. When all these things have been done, the physician has done the most good in the shortest time and can consider the transportation of the patients with due regard for fractures and internal injuries. However, the watchword in such accidents can oftentimes be "masterful inactivity—don't try to do too much."

Asphyxia can be considered in four different aspects. It may arise from tracheal obstruction, injury of the chest, paralysis of respiratory muscles or paralysis of the respiratory center. Tracheal obstruction may be caused by a foreign body, acute subglottic laryngitis, diphtheria, trauma, angioneurotic edema, phlegmon, bilateral adductor paralysis, papillomatosis, acute obstructions from some chronic diseases of the larynx such as tuberculosis, syphilis, cancer, perichondritis, rhinoscleroma, and, in unconscious individuals, by a dropping back of the tongue. For purposes of the present discussion it is necessary only to differentiate between obstruction by a foreign body or by the tongue, and any of the conditions mentioned. If traction on the tongue, inspection and palpation in the mouth and throat do not relieve the condition or reveal a removable foreign body, the serious problem of emergency tracheotomy presents itself. This is a radical procedure requiring great courage and supreme confidence.

PROCEDURE FOR TRACHEOTOMY

Where immediate tracheotomy is necessary, the patient should first be placed so that the head is downward at an angle of at least 15 degrees in order that any blood entering the trachea will run out through the mouth instead of down into the lungs. The most rapid method of doing this procedure is by making a transverse incision above the cricoid cartilage which cuts the cricothyroid ligament and allows the wound to gape and remain open. It is doubtful, however, whether this procedure should ever be done as it almost invariably predisposes to laryngeal stenosis. The preferable location for tracheotomy is through the anterior tracheal rings below the cricoid cartilage which itself should not be cut. If the thyroid isthmus is encountered, it may be retracted upward or incised. By lateral pressure with the thumb and middle finger of the left hand the neurovascular bundles can be further separated and any danger of injury thus minimized. After the critical emergency is over and

---

Presented before the Section on General Practice at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

the patient is out of danger from suffocation, enlargement of the tracheotomy wound and insertion of a tube will need to be done until the obstruction to the airway is relieved.

Chest injuries affecting respiration to a dangerous degree are more frequently seen than tracheal obstruction and require careful differential diagnosis for proper handling. Tension pneumothorax, open or sucking pneumothorax, massive atelectasis, and crushing injuries of the chest wall are the principal conditions, although subcutaneous emphysema, traumatic asphyxia, mediastinal emphysema or extravasation of blood into the mediastinum must be considered.

Closed pneumothorax of the tension type is recognized by increasing dyspnea, failing circulation, loud resonance and absence of breath sounds with displacement of the apex beat towards the opposite side and a shifting of the mediastinum. This is usually due to a puncture of the lung by rib fragments or by the rupture of an emphysematous bleb. With each inspiration the tension is increased. Treatment, obviously, is relieving the pressure by establishing an opening in the chest wall preferably through a large needle or cannula. In some cases open operations may be necessary, with suture of the pulmonary laceration at a later time. It may be necessary to insert a rubber tube into the pleural space with the lower end immersed in fluid below the level of the patient, thus allowing air to escape and the lung to expand.

In the open pneumothorax of the sucking variety where the wound opening is larger than the trachea, there will be a loss of the normal negative pressure in the pleural space with pulmonary collapse by atmospheric pressure and a shifting of the mediastinum. Treatment is immediate closing of the wound, preferably by direct pressure with a bandage or any material at hand. If a flap arrangement can be devised permitting air to escape on expiration and maintaining good pressure on inspiration, the lung will gradually expand. Surgical correction of the defect can then be done at a later time.

Massive atelectasis of the lung may follow either penetrating or non-penetrating chest injuries. The prime factor here is the presence of a plug of mucus, blood clot or foreign body in a large bronchus. A sudden rise in temperature with increased pulse and respiratory efforts are important signs. The patient's complaint of dyspnea is usually out of proportion to the degree of pulmonary involvement present. The heart and mediastinum are shifted toward the site of involvement and the percussion tone is dull to flat. There is a narrowing of the intercostal spaces. Such simple methods of treatment as postural drainage, rolling the patient on the uninvolved side, initiating cough, and thumping of the chest may be of value. Bronchoscopic removal of the plug is frequently necessary.

In extensive crushing injuries of the chest where there are fractures of several ribs on each side, allowing the sternum to collapse, a reliable first aid measure is to place the patient on the abdomen with support under the shoulders and pelvis, thus permitting the chest wall to fall forward and relieve the mediastinal and heart pressure. After the patient reaches the hospital, the rib cage can be supported by towel clips around the ribs or by placing screws into the ribs or sternum and then using a counterbalance over a system of pulleys which will permit the patient limited movement in bed.

Subcutaneous emphysema is generally self-evident and, however grotesque, requires no treatment unless complicated by pressure pneumothorax.

TRAUMATIC ASPHYXIA

Traumatic asphyxia is caused by a sudden rise in pressure in the intrathoracic veins, driving the blood suddenly up into the valveless veins of the head and neck with resultant multiple petechial hemorrhages and stasis of the blood in the tiny skin vessels. Hemorrhage into the subconjunctival tissues with protrusion of the eyes and swelling of the lids may add to this rather terrifying picture, in spite of which the patient appears fairly comfortable. No particular treatment is necessary. Prognosis is generally good. It is mentioned here as an entity to be recognized.

Mediastinal emphysema or hemorrhage into the mediastinum may be dangerous due to possible obstruction of venous return to the heart. In such cases the patient is collapsed and may be moderately cyanotic. Arterial pressure is low, the heart is small and quiet, and the pulse weak. An incision or insertion of a trocar into the extrasternal notch may be a life-saving procedure.

Paralysis of the respiratory muscles has occasionally been observed in patients with hypersensitivity to curare. Artificial respiration and the administration of neostigmine or physostigmine should be started immediately.

In electric shock, which is primarily a medical emergency, there may be paralysis of the respiratory center necessitating artificial respiration for an extended period. Spinal puncture should be the first aid given at the site of the accident when the victim is unconscious or apparently dead, or on a conscious patient whenever there are symptoms of cerebral edema or of increased cerebral pressure. Christopher[1] reported a case in which timely lumbar puncture undoubtedly was life-saving. The patient came into contact with 5,000 volts of electricity and collapsed, apparently dead, but was resuscitated by artificial respiration. Delirium and opisthotonus developed. Twenty-five cc. of bloody spinal fluid was withdrawn with difficulty owing to the violent convulsions of the patient. However, improvement continued, and within an hour the patient was fully conscious.

While hemorrhage is usually an individual problem requiring the best judgment of the physician in each case, there are a few conditions that deserve special mention. In the problem of chest injuries, the sight of profuse hemorrhage into the air passages with the patient coughing great mouthfuls of frothy, red blood is, indeed, terrifying. If it is possible to distinguish which side of the chest the bleeding comes from, no time should be lost in instituting artificial pneumothorax. The patient may be rolled on the non-bleeding side, a needle inserted into the pleural space of the bleeding side, and air allowed or forced to enter in to the amount of about 600 cc. After air is inserted, the patient is turned to the affected side to allow the blood to drain from the normal lung. Coughing should be controlled by morphine. The diagnosis of hemothorax may be more difficult than it might seem. Increasing dyspnea, pallor, rising pulse rate and falling blood pressure, massive dullness to percussion and absence of breath sounds are suggestive, but a combination of shock and atelectasis may give a similar picture. The mechanism of the injury may be a help in distinguishing between these two. Also, there is a difference in mediastinal shift.

A lacerated lung rarely bleeds to the extent that immediate emergency measures are necessary. However, if hemorrhage is from the intercostal or internal mammary vessels, either arteries or veins, surgical interference may be urgent. Bleeding through a penetrating wound into the pleura may not cease until the amount of blood lost and the cessation of respiratory movement succeeds in raising the pleural pressure to zero or above. It is futile to attempt to stop bleeding from intercostal or internal mammary vessels by catching them with a clamp in a small wound. The vessels should be accurately exposed by enlarging the incision, or finger pressure should be resorted to until this can be done. Passing a suture around the rib above and below the point of bleeding may be necessary. It is to be remembered that these vessels, because of their anastomosis, are such that they bleed from both ends. Generally speaking, bleeding from the chest wall is more serious than bleeding from the lung tissue.

Bleeding from esophageal varices can be temporarily controlled by internal tamponage with the use of a latex bag which is swallowed and then inflated.

As to emergency treatment of arterial injuries, arrest of hemorrhage is the first requirement; and while the salvage of a limb is important, the salvage of life takes precedence. The tourniquet, unless used only as a temporary measure, is to be condemned as it frequently seals the fate of an extremity.[2] Direct pressure on the bleeding point with elevation of the extremity is far more desirable. The introduction of hemostatic, absorbable material, if it is available, may be more advantageous.

The symptoms of acute cardiac compression from bleeding into the pericardial sac are falling arterial pressure, rising venous pressure and a quiet heart. Operation should be performed with as little delay as possible when there are signs of pronounced tamponade of the heart. Hospitalization and operation by an experienced surgeon are called for.

Rupture of the spleen in infectious mononucleosis is another circumstance entailing possibility of hemorrhage. In any of the acute illnesses leading to a large, dilated, vascular spleen, this organ should be palpated with gentleness, as vigorous palpation may lead to hemorrhage.

HEAD INJURIES

The treatment of head injuries calls for distinguishing between those requiring conservative treatment and those in which operation is indicated. In the early management almost every aspect except the treatment of shock and the control of external hemorrhage[3] can be completely disregarded. Morphine is given only to the conscious patient. If a patient has had a lucid period following head injury and then symptoms of increased intracranial pressure with hemiplegia and headache develop with lapse into unconsciousness, the condition of extradural hematoma, probably from middle meningeal artery hemorrhage, must be considered and operation performed without delay.

If a spinal puncture is done and the pressure found to be greatly elevated, it should not be reduced too rapidly lest it cause herniation of the brain stem. Spinal puncture is ordinarily contraindicated for patients with bleeding from the ear or with suspected extradural or subdural hemorrhage except to determine the degree of pressure or to note the appearance of fluid without removing any of it.

A lesion which leads to complete transection of the spinal cord at the level of the fourth cervical segment (second cervical vertebra) usually is fatal because of involvement of the phrenic nerve. Frequently lesions slightly lower than this may involve the phrenic nerves by edema. Care should be exercised in the handling and transportation of patients with cervical injuries. Traction and adequate support are essential.

Cardiac arrest at the operating table is infrequent but vitally important. Since effective treatment must begin within three to five minutes after cardiac arrest, a definite plan of action must be prepared in advance. The anesthetist must immediately begin artificial respiration using 100 per cent oxygen with a clear airway. This condition is further treated by immediate cardiac massage, by placing the patient in a moderate Trendelenburg position, and by the use of epinephrine and procaine. By lowering the head, cerebral circulation is encouraged. Studies indicate that the first three to five minutes of cerebral hypoxia, of whatever cause, are critical. After that interval, irreversible cortical and medullary changes appear. It is recommended that massage be started within three minutes of cardiac arrest. Massage is maintained at the rate of 40 to 50 strokes per minute with a compressing and gliding movement of the hand beginning at the apex and moving toward the great vessels.

It appears that intravenous use of procaine (10 cc. of 1 per cent solution) and epinephrine (0.5 cc. 1:1,000 in 9.5 cc. isotonic solution of sodium chloride) offers some protection against ventricular fibrillation and cardiac arrhythmias. Epinephrine alone is used rather routinely but with varying results.

For massage, approach to the heart can be made by transverse incision in the left third or fourth interspace, followed by section of the costal cartilage above and below and wide retraction of the ribs. Warm saline solution should be poured over the heart to prevent dehydration. It is to be noted that the chances of success with this method of treatment are not good. However, in a series of nine cases over a five-year period at the Lahey Clinic, the heart was revived in every instance.

Ventricular fibrillation is the most frequent complication and is fatal unless quickly corrected. Procaine, barium chloride, and electric shock are useful.

Intra-abdominal surgical emergencies such as ruptured peptic ulcers, ectopic pregnancies, ruptured urinary bladder, mesenteric thrombosis, and acute pancreatitis are too large a problem for discussion herein, but it is well to mention one entity which may not be remembered in the differential diagnosis of acute abdominal pain, and that is the bite of the black widow spider, Lactrodectus mactans. From 15 to 30 minutes after a bite, pain reappears at the site of the bite and spreads all over the body, reaching its maximum about an hour later. There is generalized muscle spasm and very often boardlike rigidity of the abdominal muscles. While the pain may be agonizing, there is no localized area. Spinal puncture may be of real value in relieving the symptoms, as there is usually elevation of the blood and spinal fluid pressure.

REFERENCES

1. Christopher, Frederich: Minor Surgery, Second Edition, 1934, p. 158.

2. Freeman, Norman E.: J.A.M.A., 139:1125-1128, April 23, 1949.

3. Jaeger, Rudolph: Industrial Medicine, 18:47-51, Feb. 1949.

What Is an Internist?

VERNE R. MASON, M.D., *Beverly Hills*

AN internist may be defined as a physician who is skilled in the diagnosis of internal diseases and in their treatment by many and varied modalities, techniques, herbs and drugs, but not by cutting, lithotomy, couching for cataracts, male midwifery, barber-surgery or general surgery.

I do not lay claim to any skill in etymology nor to wisdom in either medical lore or history. However, my efforts to find the root or the date of birth of the word "internist" have left me with great respect for medical historians. But their erudition was so profound that they paid little attention to such a minor detail as the derivation of the word commonly used to designate a specialty. As a result it became a major task to find pertinent data on the origin of the term.

The word "medic" is derived from the Latin word "mederi" which means to heal. A medic is, therefore, a physician, a medical-man or a healer. The term "medical-man" is obviously a generic expression used to designate both physician and surgeon by means of classing both together as healers. Before the 15th Century, and perhaps much earlier, the word "medicine" was used approximately in the same sense as the French word "medecin" to mean a physician or healer, as in the following quotation from Shakespeare: "I have seen a medicine that's able to breathe life into a stone." The term "medicine" was also used in early Anglo-French medical writings to connote the phenomenon of curing or healing by medicines, as in the famous quotation from Shakespeare: "Not Poppy, nor mandragora . . . shall ever medicine thee to that sweet sleep which thou ow'dst yesterday."

The word "physician" is derived without doubt from the Latin word "physica" which means knowledge of nature and natural phenomena. Just how this word came to refer to medicine is not entirely clear. Before 1400 A.D., Chaucer wrote "Farewel Phisik; go ber the man to Chirche." At about the same time the following quotation appeared and I have lifted it from the pages of the Oxford Dictionary: "O Lord, whi is it so greet difference betwixe a cirurgian & a physician." Thus very early in our language and in the Anglo-French dialects the word "physician" was used as an appellation for a healer; a man with a knowledge of nature as distinguished from one qualified as a surgeon only.

The word surgeon is derived from an old Anglo-French word "surgien" apparently introduced much later into medical lore and history than either the word "medicine" or the appellation "physician." The Greek root from which the word "surgeon" had its origin means handwork or manual skill and thus the surgeon is one who treats diseases by manual methods or by operative or instrumental modalities.

The barber was at first employed to function as an ancillary service of the Church, since he was skilled primarily in shaving the heads of the monks. Gradually he learned to use his tools for other purposes, possibly more lucrative, and he became a barber-surgeon, a trade or profession which dominated for a time all surgery and was controlled in turn by the Church and its papal bulls. The strife and rivalry between the physicians, surgeons, and barbers continued well into the 17th Century, and in certain areas into the 18th Century. The barbers irritated the surgeons, but the surgeons, even after much strife and struggle, did not get rid of them until 1745. "When the surgeon was in a manner, assimilated to the status of the physician, he began to put on airs like the latter" and Patin, dean of the Paris Faculty, called him "an evil, extravagant coxcomb who wears a mustache and flourishes a razor." One may easily comprehend how medicine of the kind practiced by the barber-surgeon and the peripatetic criminals, rogues, and vagabonds, who had learned from the barber to make a living as cataract-couchers, lithotomists, herniotomists and booth-surgeons, came to be called "external" medicine in contradistinction to "internal" medicine which was the medicine of the physician and the medicine of the haughty, learned professor and at that time the only practice of medicine not subject to the dictates of papal bulls.

The word "internist" does not appear in the Shorter Oxford Dictionary nor is any explanation made of the use of the term "internal medicine." In Webster's Unabridged Dictionary the statement is made that the word "internist" is probably derived from the root "intern-" taken from the designation "internal medicine." This leads one to consider, probably with a reasonable degree of certainty, that the word "internist" came into general use later than the appellation "internal medicine." The word "internist" is doubtless unrelated to the term "intern" which is defined as an assistant physician who resides in a hospital, in contrast to the word "extern" which is usually applied, medically, to a physician who works in but does not reside in a hospital.

In a personal letter to me Dr. George Blumer stated that "the use of the term 'internal medicine' goes back a long time, how long I do not know, and I predict that it would take considerable bibliographic research to settle the matter, if it could be definitely decided at all." I can testify to the probable truth of his prediction, for I have not been able to find any date on which the term "internist" first definitely appeared in medical writings. The

---

Presented before the Section on General Medicine at the 78th Annual Session, Los Angeles, May 8-11, 1949.

inability to fix dates definitely in the history of science is a frequent difficulty because, unlike politics, great and violent changes do not occur to fix the dates of more commonplace events such as the introduction of a new term into medical literature. Be that as it may, one can feel certain that the term "internist" was coined in the period of wrangling between the physician and the barber-surgeon combination, surely before the year 1745 when the barber-surgeon disappeared from England.

Consideration of the scanty data which are available may clarify the atmosphere for a discussion of the chief problem, videlicet, what is an internist? The roots of the dissatisfaction with the word "internist" as the designation for a great medical specialty are two. First the term is not sufficiently descriptive and, second, it means little or nothing to the average or even the intelligent layman. Furthermore, under the designation "internal medicine" are included a number of other specialties known by terms in no way derived from the words "internal medicine." These subspecialties are psychiatry, neurology, dermatology, allergy, cardiology, gastroenterology, hematology, endocrinology and a few others. With few exceptions most physicians who claim to be specialists in one or another of these subspecialties are actually spending some or much of their time in some other variety of general medical practice than their designated specialty. This situation as well as certain other compelling circumstances has made it seem desirable for the specialty boards to require adequate training in internal medicine and certification by the Board of Internal Medicine before an applicant may be examined to become a diplomate of one of the subspecialties of internal medicine.

I may now pose the question which is also the title of this paper: What is an internist? Either he is a specialist in what remains of internal medicine after all the subspecialists have taken their particular groups of patients out of the broader field of internal medicine, or he is a physician of superior intelligence and experience who is capable of posing as a specialist in the whole field of internal medicine, or he is a physician who has limited his practice to one of the subspecialties of internal medicine.

The layman will certainly not understand this bizarre situation and in most instances when illness comes to him or his family he will request consultation with either a specialist or a diagnostician. I have observed on innumerable occasions that under such circumstances he will never request consultation with an internist since he does not understand the meaning of that designation.

The word "internist" is unsatisfactory for reasons already set forth and for a number of others which will be considered now. Since an internist is actually a physician skilled in the techniques of internal medicine, the word "diagnostician" might be used as a more appropriate designation. This term, however, is too restricted because any internist has many more duties than simply those of a specialist who makes a diagnosis. Furthermore, the word "diagnostician" is too austere and rigid in its implications. The expression "specialist in internal medicine" is too cumbersome and unwieldy for practical use although it is entirely accurate in meaning and connotes exactly what an internist is or should be. In addition, it contains the important word "specialist," which must be the *sine qua non* of any expression used as a satisfactory substitute for the word "internist."

At present there are three fundamental branches of the practice of medicine—medicine, surgery and general practice. And the practitioners in these branches are medical specialists, surgical specialists, and general practitioners. These terms used to designate the three essential branches of medicine are short and have the proper connotation and, in addition, are historically and etymologically correct. They are comprehensible to the layman and to the non-medical scientist.

How can these terms be applied to the nomenclature of the Board of Internal Medicine? This seems very simple. A successful candidate becomes a diplomate of the Board of Medical Specialists. Before a candidate can be certified in one of the subspecialties of internal medicine he must have qualified as a medical specialist by successfully passing the examination of the Board of Medical Specialists. Then, if he is successful in passing the examination of the subspecialty board, he becomes a medical specialist in allergy or cardiology or gastroenterology as the case may be. Thus it becomes obvious that his certification denotes that he is primarily a medical specialist and secondarily an expert in one of the lesser specialties within the scope of internal medicine. The Board of Internal Medicine has already issued a listing of diplomates with the title "Directory of Medical Specialists."

I have stated the problem and I believe it is perfectly clear that there is a real problem and that its solution would be desirable. The best solution which seems adequate at this time has been presented.

The answer to the question, "What Is an Internist?" may now be given without detriment to the historical and etymological aspects of the terms employed. An internist is a medical specialist in contradistinction to a surgical specialist and he practices internal medicine as distinguished from external medicine. The terms "internist" and "internal medicine" were probably used first early in the modern era to differentiate the physician who studied and treated internal affections from the barber-surgeons and surgeons who treated external diseases, since even as late as 1766 "surgical practice was mainly in the hands of the barber, the executioner, and the strolling bone-setters, cataract-couchers, herniotomists and lithotomists, of whom the famous Dr. Eisenbart was the type."[1]

121 North San Vicente Boulevard.

REFERENCE

1. Garrison, F. H.: History of Medicine, Philadelphia and London, W. B. Saunders Co., 1929, p. 395.

Bronchial Asthma in Adults

Causes and Treatment

Albert H. Rowe, M.D., and Albert Rowe, Jr., M.D., *Oakland*

SUMMARY

Food and inhalant allergens were of about equal importance in producing bronchial asthma in 907 adults between the ages of 15 and 55 years.

Drug and especially bacterial allergens were infrequent causes.

Psychogenic factors may activate or exaggerate causes mentioned but were not the sole cause of any case in this series.

Food allergens are best studied and controlled by the standardized cereal-free elimination diet and at times other elimination diets. Test-negative diets usually fail because of the fallibility of both negative and positive skin tests.

Inhalant allergy is controlled by the elimination of causative allergens by varying degrees of environmental control and often by pollen and dust filters in the window. Desensitization is necessary against those allergens that cannot be removed from the environment. Dilutions in the millions and billions may be required.

Morphine and other opiates, Demerol, chloral, paraldehyde and large or moderate doses of barbiturates are contraindicated in bronchial asthma, as emphasized by deaths resulting from the use of them.

Bronchoscopy is indicated for bronchial obstruction due to inspissated mucous plugs, but the danger of the procedure, especially with much sedation, must be recognized.

When secondary infection is probable, the use of sulfadiazine, penicillin, aureomycin and chloramphenicol must be considered.

FOOD and inhalant allergens in about equal degree caused practically all of the bronchial asthma in 907 private patients, 15 to 55 years of age, treated during the seven-year period up to 1948 (Table 3). Drug and, to a lesser extent, bacterial allergens were of minor importance. With persistent study and control of the causes mentioned, vague intrinsic causes and psychosomatic influences were only of occasional and minor significance.

The data in Table 1 warrant additional comment. Familial predisposition to bronchial asthma and, to a lesser extent, to nasal allergic disease is shown. Despite the fact that chronic or recurrent asthma had been present for more than ten years in 30 per cent of the patients and for more than five years in an additional 50 per cent, definite or excellent relief was obtained with treatment. Regularly recurrent attacks and so-called "colds" before attacks were less frequent than in a group of infants and children up to 15 years of age previously reported upon.[4] In the present series as with the children, "colds," when they did occur before attacks, usually resulted from

Table 1.—*Bronchial Asthma in Adults*

(Data on 907 private patients relieved by treatment in which they cooperated for more than six months)

	Number of Patients	Per Cent
Males	391	43
Females	516	57
Family history:		
Bronchial asthma	388	42
Nasal allergic disease	170	19
Headaches	77	8
Eczema—hives	35	3
Gastrointestinal symptoms	41	4
Duration of asthma (years):		
0 - 1	135	15
1 - 2	114	13
2 - 5	196	22
5 - 10	186	20
10 or more	276	30
Degree of asthma:		
Moderate	309	34
Pronounced	484	53
Severe	114	13
Attacks of asthma:		
Regularly recurring	135	15
Irregularly recurring	550	60
"Colds" before attacks	109	12
Asthma perennial	534	59
Exaggerated in:		
Spring	299	33
Summer	231	23
Fall	182	20
Winter	205	22
Other manifestations:		
Nasal allergy:		
a. perennial	431	47
b. spring to winter	289	32
Eczema	127	14
Hives	109	12
Headaches	119	13
Gastrointestinal symptoms	150	16
Positive dietary history	359	39
Positive drug history	142	17
Positive environmental history	341	37

Presented before the Section on Allergy at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

allergic sensitivity to foods rather than from infection or bacterial allergic disease. Moreover, the previously reported[6] long observation of exaggeration of allergic reaction to foods from early fall to late spring, and especially in the winter months, was confirmed by results obtained during these months in this adult group by the control of dietary factors. The exaggeration of asthma in these months did not occur in so large a percentage of patients in the present series as in the previously reported groups of infants and children and old patients.[5] The greater frequency of nasal allergic disease as compared with other clinical manifestations of allergic reaction in these patients is emphasized in data on the present series. In fact the bronchial and nasal tissues were the only sites of clinical allergic response in many of these patients. A further observation was that only about half of the patients in this series who were found to have sensitivity to food or inhalants (Table 3) gave a history indicative of allergic reaction to such agents.

TABLE 2.—*Number and Degree of Skin Reactions* (Scratch) in 907 Adults with Bronchial Asthma*

	Number of Patients	Per Cent
1. Pollens:		
a. Trees:		
0 - 1 plus	213	23
1 - 5 plus	110	12
5 plus up	14	1.5
b. Grasses:		
0 - 1 plus	206	23
1 - 5 plus	190	21
5 plus up	72	8
c. Fall:		
0 - 1 plus	215	24
1 - 5 plus	168	19
5 plus up	27	3
d. Cultivated flowers:		
0 - 1 plus	155	17
1 - 5 plus	91	10
5 plus up	4	.4
Reactions to pollens occurred in 62 per cent of all patients.		
2. Animal emanations:		
0 - 1 plus	231	25
1 - 5 plus	109	12
5 plus up	11	1
3. Miscellaneous inhalants:		
0 - 1 plus	176	19
1 - 5 plus	86	9.5
5 plus up	8	.9
4. House dust:		
0 - 1 plus	201	22
1 - 5 plus	184	20
5 plus up	2	.2
5. Fungi—of patients tested, reactions in approximately	27	3
6. Foods:		
0 - 1 plus	151	17
1 - 5 plus	57	6
5 plus up	10	1
7. No reactions	137	15

*Clinical significance of positive reactions determined by history and results of treatment. Patients actually sensitive to foods often had negative reaction to skin tests; this disagreement was less often noted in patients who had sensitivity to inhalants.

RESULTS OF SKIN TESTS

The results of skin testing are shown in Table 2. Scratch testing was routine. Intradermal testing with suspected inhalants was done only if there was no reaction to them by scratch test.[7] Intradermal testing with food allergens was rarely done because the occurrence of many impertinent reactions, due to probable past or potential allergy or to non-specific causes, makes results inconclusive.

Negative reactions to allergenic foods and to a lesser extent to inhalants by both methods sometimes occurred in the face of contrary clinical evidence. Reaction to pollens occurred in 62 per cent of the 907 patients. The failure to demonstrate pollen sensitization in all of the 70 per cent of the patients (see Table 3) in whom it was of clinical importance harmonizes with the experience of others[1] and stresses the importance of history of probable sensitivity to pollens. On the other hand, the clinical importance of animal emanations, miscellaneous inhalants and house dusts, as shown in Table 3, did not equal the frequency of skin reactions to these allergens as recorded in Table 2. This indicates that many reactions, especially the milder ones, were non-specific or were merely indicative of potential allergic disease. It is noteworthy that when allergic reactions to foods and pollens are controlled, certain patients are concomitantly relieved of symptoms apparently caused by house dusts and other inhalants, even without specific desensitization to them.

The small number of reactions to fungi noted in this series may be due in part to the fact that testing with them was done only when they were suspect. In the West, where dampness in homes is rare and minimal, the spore content of the air is low and Alternaria not frequently found. (Now, however, testing with important fungi has been adopted as routine, with resultant moderate increase in the percentage of positive reactions.)

INCONSISTENCY OF TEST RESULTS

The relative infrequency of skin reactions to foods, especially reactions greater than one-plus in degree, in comparison with the demonstrated importance of food allergy as shown in Table 3, emphasizes the well recognized fallibility of the skin test[7, 8] and the frequency of negative reactions to

TABLE 3.—*Allergens Causing Bronchial Asthma as Indicated by Results in 907 Adults for More Than Six Months Who Cooperated in Treatment*

	Number of Patients	Per Cent
Food alone	179	20
Food and other allergens	471	52
Inhalants and other allergens	722	80
Pollens and other allergens	638	70
House dust and other allergens	168	19
Animal emanations and other allergens	62	7
Miscellaneous inhalants and other allergens	40	4
Fungus and other allergens (approx.)	....	1
Bacterial and other allergens	14	1.5
Aspirin	....	3

foods that are clinically demonstrated to be the cause of allergic disease.

In observation of the present and previously reported series, certain characteristics of bronchial asthma due to allergic reaction to inhalants, and of bronchial asthma due to food allergens, have been noted:

Bronchial Asthma Due to Inhalant Allergens

1. Develops at any time of life, even in infancy and old age.
2. Usually starts later in childhood than does bronchial asthma due to allergic reaction to food.
3. Slightly more important than food as a cause of bronchial asthma in the age group 15 to 55 years; slightly less important in childhood and old age.
4. Continued inspiration of causative inhalants produces more persistent asthma and fewer cyclic attacks than does the daily ingestion of allergenic foods.
5. The occurrence and degree of asthma depend on the amounts of inspired pollen, animal emanations, fungi and other inhalant allergens, and on the degree of sensitization in the pulmonary tissues.

Bronchial Asthma Due to Food Allergens

1. Develops at any time of life from infancy to old age. Often starts in the second year, preceded by infantile eczema.
2. Regularly recurring attacks with or without moderate intervening symptoms often arise from foods eaten every day.[4] Intervening relief or decrease in symptoms probably is due to refractoriness to the allergenic foods, resulting from the exhaustion of the reacting bodies to those foods in the bronchial tissues. (Inhalant and bacterial allergens infrequently produce such cyclic attacks.)
3. Attacks often are preceded by "head colds" for one to three days.[4] These "colds" and at times the associated fever usually result from allergic reactions to foods rather than from infection.
4. Asthma due to food allergens may be exaggerated or may occur only in the fall to spring and especially in the winter months.[6]

THE CAUSES OF BRONCHIAL ASTHMA IN ADULTS

Accurate use of trial diet, especially of the cereal-free elimination diet,[7] was of great help in the recognition of allergic asthma caused by foods. The occasional allergic reaction to various foods in this diet, especially to beef and bacon and at times to the legumes, to white potatoes and, rarely, to many or all fruits, had to be kept in mind. Modification of the basic cereal-free elimination diet was necessary in some cases when after adequate trial it did not relieve bronchial asthma suspected of being caused by sensitivity to food. Sensitivity to beef was found to exist in some patients who had reaction to cow's milk, and evident sensitivity to certain fruits occasionally was associated with apparent sensitivity to all fruits. When suspicion of individual foods in the elimination diet arose, additional information at times was obtained by the use of the leukopenic index as advised by Vaughan,[9] and more recently, by feeding tests in accordance with the methods of Randolph[2] and Rinkel.[3] By these means food was demonstrated to be the sole cause of bronchial asthma in 20 per cent of the patients, and a major or secondary cause along with inhalant or other allergens in an additional 53 per cent, as shown in Table 3.

Of the inhalants, pollens were of the greatest importance. House dust and, to a lesser degree, animal emanations and other miscellaneous inhalants were of lesser importance (Table 3). Clinical allergic disease caused by these inhalants (other than pollens) occurred much less frequently than did skin reactions to them, as shown in Table 2. The importance of inhalants as allergenic agents of course varies with the degree of exposure to them. Relatively few of the patients in this series were in intimate contact with animals in the home, on the farm or in their working environment. Three patients who worked in grain and seed warehouses were sensitive to environmental allergens and were satisfactorily desensitized to them. The infrequency of skin test reactions to fungi and of clinical allergic disease due to fungi was ascribed to the freedom from dampness and humidity in most homes compared with such conditions in areas of greater humidity.

The infrequency of demonstrated bacterial allergic disease in this series is explainable, in the author's opinion, by the persistent search for and recognition of inhalant and, especially, food sensitivity. Previous diagnoses of bacterial allergic disease for which sinuses had been washed and operated on, and injections of vaccine and often of dusts had been given, were disproved when the disease was relieved by control of allergenic foods and/or inhalants. As a major cause of bacterial allergic disease, apical infection of the teeth and gingivitis were important. Infection in sinuses (arising too often from previous unnecessary washings or operations), in the bronchial tract (particularly when actual bronchiectasis was present, as it was occasionally) and, to a very minor degree, in other common foci was of minor and often of questionable allergenic significance.

PSYCHOSOMATIC ASPECTS

Psychosomatic influences were not recognized as the sole cause in any true case of bronchial asthma in this series. Dyspnea from hyperventilation and nervousness occurred at times but was not confused with that caused by bronchial asthma. When potential or mild bronchial asthma due to allergic reaction to foods or inhalants was present, nervousness and excitement did at times activate or exaggerate the symptoms. This did not occur, however, when the allergenic causes were controlled. In the authors' opinion, therefore, true psychogenic bronchial asthma rarely if ever occurs, and psychogenesis should never be assumed until other possible factors —foods, inhalants, drugs and bacteria—have been carefully investigated. Nervousness and frustration from invalidism and incapacitation from uncontrolled chronic bronchial asthma and from failure of previous medical therapy were initial problems in certain patients in this series. In such circumstances reassurance and practical psychological support were given along with the necessary control of the allergenic factors.

Asthma caused by acetylsalicylic acid occurred in 4 per cent of the patients in the series. Asthma from other drugs was not recognized in any of the patients, but in a few patients other manifestations of allergic disease, especially nasal and cutaneous reactions, were caused by sensitivity to other drugs, especially to quinine, arsenicals, barbiturates, iodine and iodides.

UNRELIEVED PATIENTS

During the eight-year period covered by this report, 202 additional private patients between 15 and 55 years were unrelieved. As shown in Table 4, only 7.4 per cent of these patients cooperated in treatment for six months or more; 36 per cent accepted no treatment after the initial diagnostic study; another 45 per cent received treatment for less than three months, and usually gave poor cooperation. These poor results stress the necessity of continued study of all possible allergenic factors and full cooperation of the patient over a period of at least six months and usually for a year or more if satisfactory results are to be obtained and maintained.

DEATHS

Death occurred in 11 patients during the eight-year period. Two patients, observed in consultation, died within two days, largely as the result of previously injected morphine. One patient, in whom asthma had been well controlled with the cereal-free elimination diet for one year, departed from the diet while on a vacation. Severe asthma resulted and she was given 0.4 gm. of sodium amytal and 0.2 gm. of phenobarbital during a 14-hour period. When the patient arrived at the hospital, cyanosis and stupor were profound and she died despite treatment. Autopsy was not done.

Another patient died following the injection of 32.4 mg. of codeine and oral administration of 0.2 gm. of Nembutal® during the night. At autopsy, minute hemorrhages throughout the brain, resulting from anoxemia, were noted.

A similar result occurred in another patient who had been given 0.2 gm. of sodium amytal and 16 cc. of paraldehyde per rectum and 8 cc. of paraldehyde by mouth.

A young woman with asthma well controlled with cereal-free elimination diet and pollen and dust therapy departed from the diet and extreme asthma developed. On arrival at the hospital she was cyanotic, pulseless and in shock. Emergency treatment revived her temporarily but death from heart failure occurred on the second day.

TABLE 4.—*Unrelieved Bronchial Asthma in 202 Adults*

	Number of Patients	Per Cent
Poor cooperation	187	92.4
Good cooperation for six months or more	15	7.6
Duration of treatment:		
None	73	36
1 - 4 weeks	54	27
1 - 3 months	37	18
3 - 6 months	28	13
6 - 12 months	20	10

One other patient with a history of severe asthma intermittently for several years obtained good control for one year with an elimination diet and pollen and dust therapy. During an unexplained severe attack death occurred from respiratory failure. Bronchoscopy early in this attack might have been valuable.

Pneumothorax developed in a man with chronic asthma. When this patient was seen in the evening, dyspnea had greatly decreased, but during the night he died. Permission for autopsy was refused.

One man had received morphine with increasing frequency during a six-month period because of chronic long-standing bronchial asthma. Cooperation with treatment was poor; the patient continued to "want injections." The bronchial tract was filled with tenacious mucus. In spite of treatment (as outlined later in this presentation) for severe asthma. including bronchoscopy, the patient finally died of heart failure. Permission for autopsy was refused.

One young man was relieved of severe bronchial asthma for three years with the cereal-free elimination diet, but ultimately he returned to a general diet. Gradually the asthma returned and the patient died in a severe attack during which sedatives were unfortunately repeatedly administered.

Severe chronic asthma in a woman was controlled with cereal-free elimination diet and pollen therapy for two years. Then, with the assurance that daily intravenous injections of B complex vitamins and crude liver extract intramuscularly and other injected and oral medication would "cure her asthma" without any restrictions in diet, this treatment was accepted and followed for several weeks. Severe asthma recurred with resultant asphyxia and death on an emergency trip in an automobile to a physician's office.

Four of the deaths reported in the preceding paragraphs were directly due to breaks in the elimination diet, which previously had controlled the symptoms. Eight deaths were due, in the author's opinion, to anoxemia and other results of sedation. One death was from respiratory failure from persistent prolonged bronchial asthma in a patient who was addicted to morphine. One death resulted from increasing pneumothorax superimposed on chronic bronchial asthma. One other death occurred from heart failure during a severe unexplained prolonged attack of bronchial asthma.

TREATMENT

The plans of treatment followed by the authors for moderate bronchial asthma and severe or intractable bronchial asthma are as follows:

Moderate Bronchial Asthma

Specific Treatment

1. When food sensitivity is suspected, use the cereal-free elimination diet.[7]
2. When inhalant sensitivity is suspected, use:
   a. Strict environmental control in bedroom, sitting and working rooms.
   b. Hyposensitization with antigens containing probable allergenic inhalants to which the patient is exposed. Do not overdose. Dilutions in the millions or even billions of "multiple antigens" often are necessary.
3. When bacterial allergic disease is suspected, remove foci of infection. At times hyposensitization with autogenous vaccines is necessary.
4. Sensitivity to drugs, as to acetylsalicylic acid, must be remembered.

Control of Symptoms

1. Ephedrine alone or in combination with barbital and aminophyllin relieves mild symptoms. Enteric-coated tablets delay the effect.
2. Potassium iodide (8 to 15 drops of saturated solution thrice daily) often relieves symptoms. (Swelling of the submaxillary glands, nasal blocking, headaches, and skin eruption indicate sensitivity to iodine.)
3. Epinephrine.
   a. Inhalation of a vaporized 1:100 solution relieves mild asthma.
   b. Subcutaneous injection of a 1:1,000 solution (0.1 cc. to 0.8 cc., according to age, every one-half to six hours) relieves moderate asthma.
   c. Intramuscular administration of epinephrine in gelatine prolongs the effect.
4. Antihistaminics by mouth, in doses according to age, relieve some patients.
5. Aminophyllin: If given by mouth, 0.2 gm. every 3 to 6 hours; if by rectum, 0.48 gm. every 3 to 6 hours; if intramuscularly, 0.23 to 0.32 gm. every 4 to 8 hours; and if intravenously, 0.48 gm. every 8 to 12 hours. (The intravenous administration is the most effective, but the injection must be given over a 3-minute period.)
6. No opiate, Demerol,® paraldehyde, chloral or barbital (except at times small doses of barbiturates) should be administered to any asthmatic patient.
7. Bronchoscopy is indicated to remove obstructing bronchial mucus and to investigate the causes of obstruction. (It should be noted that the procedure can result in death, especially if the patient is under heavy sedation.)
8. Sulfadiazine and other antibiotics are necessary for treatment of secondary infection.

Severe or Intractable Bronchial Asthma

Specific Treatment

1. Food sensitivity must be suspected in all cases. The cereal-free elimination diet should be ordered in a liquid, minced or soft form if necessary.
   a. With vomiting, intravenous saline is necessary. (Glucose may increase asthma in corn-sensitive patients.)
2. Inhalants must be considered in all cases by establishing strict environmental control in a dust- and pollen-free room, best in a hospital. A pollen and dust filter in the window is usually advisable.
   a. Hyposensitization with suspected specific inhalants should be delayed until relief is definite.
3. If bacterial allergic disease is suspected, removal of foci of infection is indicated when severe asthma abates.
4. Sensitivity to drugs, as to acetylsalicylic acid, must be remembered.

Control of Symptoms

1. Epinephrine, 1:1,000 solution, subcutaneously in doses of 0.5 cc. to 0.8 cc. every one-half hour. If several doses give no relief, stop, or give infrequently until the following therapy decreases symptoms.
2. Aminophyllin intravenously (0.32 to 0.48 gm.) over a 3-minute period every 8 hours if necessary. Severe asthma is less often relieved by rectal or intramuscular administration.
3. Appropriate parenteral fluids must be given, as indicated, for dehydration or vomiting. (Glucose may increase asthma in corn-sensitive patients.)
4. Oxygen by nasal catheter, mask and especially by tent helps very severe asthma and particularly anoxemia. Oxygen-helium by suitable mask or by Barach's pressure hood has not been used by the author in control of severe cases.
5. As symptoms decrease, ephedrine, epinephrine by inhalation, and aminophyllin by mouth, 0.2 gm. every 3 to 6 hours, may be tried, for relief of moderate symptoms.
6. Bronchoscopy is indicated for bronchial obstruction due to inspissated mucus. Its dangers must be recognized.
7. Opiates including Demerol,® barbiturates, paraldehyde and chloral are contraindicated; resultant stupor may lead to anoxemia and death.
8. When secondary infection is a factor, sulfadiazine and penicillin should be utilized. Possible benefit from aureomycin, chloramphenicol and streptomycin must be considered.

CEREAL-FREE ELIMINATION DIET

Advantages of the standardized cereal-free elimination diet for the study of food allergens in bronchial asthma are as follows:

1. Excludes foods which frequently cause bronchial asthma.
2. Tells patients what to eat and provides detailed menus and recipes for bakery products for meals at and away from home.
3. Maintains weight and nutrition if diet is accurately followed. Hence the diet can be maintained for days, weeks or longer periods until: (1) allergens of causative foods are eliminated from the body; (2) changes in lungs resulting from food allergens decrease or disappear.

Cereal-Free Elimination Diet (Rowe)

(Modify as indicated by history of definite food idiosyncrasies or dislikes and by large scratch test reactions to specific foods.)

FOODS ALLOWED

Tapioca
White potato
Sweet potato or yams
Soy-potato bread
Lamb
Beef
Chicken (no hens)
Bacon (Swift's) *
Lettuce
Spinach
Chard
Carrots
Beets
Artichokes
Tomato
Squash
Asparagus
Peas
String beans

Lima beans
Lemon
Grapefruit
Pears
Pineapple
Apricots
Prunes
Cane or beet sugar
Salt
Soy oil
Gelatin, plain
Maple syrup
Cane sugar syrup
White vinegar
Vanilla extract
Lemon extract
Baking powder (corn-free)
Nuspread (a hydrogenated soy oil substitute for butter)

MENUS (ABBREVIATED)*[7]

BREAKFAST

Grapefruit or tomato juice.

Tapioca or potato starch cooked with fruit in the diet and sugar.

Lamb chops, beef steak, patties or tongue, bacon.

White or sweet potato, baked, boiled or fried with bacon.

Soy-potato bread or muffins† with Nuspread. Jam or jelly of fruits listed may be used.

Soy-potato pancakes or waffles with Nuspread and cane syrup.

Fruits as specified, fresh or canned.

LUNCH OR DINNER

Soup: (a) Broth made of lamb or beef containing specified vegetables (no canned soups). Strained lamb or beef (Gerber's or Swift's) may be used with or without allowed vegetables. (b) Lima or split pea pureed flavored with bacon.

Salad made of specified vegetables or fruits. Dressing of soy oil, vinegar, or lemon juice, salt and sugar.

Meat—lamb, beef, or chicken (no hens). (No condiments or flavors.)

Vegetables as specified.

White or sweet potato.

Soy potato bread or muffins with Nuspread.

Jam or jelly of specified fruits.

Desserts: Specified fruits, tapioca fruit or caramel puddings. Soy potato cookies or cake.

Candy made of sugar, flavors, and fruit in the diet.

Water.

†RECIPE FOR SOY-POTATO MUFFINS OR BREAD

1 cup soy flour (full-fat)
1 cup potato starch
1 tsp. salt
⅓ to ¼ cup soy oil

3 tbsp. baking powder‡
2 tbsp. white sugar
1 tbsp. brown sugar
1 to 1⅛ cup water

Sift the soy flour once before measuring. Fill the measuring cup lightly and level off the surface with a knife blade. Sift all the dry ingredients together one time. Add the oil and water and beat well. Pour the batter into muffin pans which are well greased with soy oil. Bake in a moderate oven (300 to 350° F.) for 25 to 30 minutes.

For bread, bake in a small loaf pan at 300° F. for 1⅓ to 1½ hours, as required.

---

‡Baking powder containing potato starch instead of corn starch is available on the market.

2940 Summit Street.

REFERENCES

1. Peshkin, M. M.: A dry pollen ophthalmic test in pollen asthma and hay fever patients negative to cutaneous tests, J. Allergy, 3:20, Nov. 1931.
2. Randolph, T. G.: Diagnosis of food allergy, Medical Clinics of Northern America, Vol. 32, Jan. 1948.
3. Rinkel, H. J.: The technique and clinical application of individual food test, Annals of Allergy, 2:504, Nov.-Dec. 1944.
4. Rowe, A. H.: Bronchial asthma in infants and children, California Medicine, 69:261-268, Oct. 1948.
5. Rowe, A. H.: Bronchial asthma in patients over the age of 55, Annals of Allergy, 5:509-518, Nov.-Dec. 1947.
6. Rowe, A. H.: Seasonal and geographic influences of food allergy, Journal of Allergy, 13:55-60, Nov. 1941.
7. Rowe, A. H.: Elimination Diets and the Patients' Allergies, Lea and Febiger, 1944.
8. Rowe, A. H.: Evaluation of skin reactions in food-sensitive patients, J. Allergy, 5:135, Jan. 1934.
9. Vaughan, W. T., and Black, H.: Practice of Allergy. Mosby, 1948.

---

*Published menus[7] contain detailed menus with specified amounts of foods and recipes for bakery products containing protein 60-100 grams and 2,000 to 3,000 calories.

Menus for infants and children are available.[7] Soy milk or strained meats replace milk in the diet.

Treatment of Migraine

Results with Dihydroergocornine Methanesulfonate (DHO-180) and Other Ergot Derivatives

NICHOLAS A. BERCEL, M.D., *Los Angeles*

SUMMARY

A comparison of nicotinic acid, a non-narcotic analgesic and a series of injectable and oral ergot preparations tested by various methods in treating 40 patients with typical migraine indicate that ergot alkaloids are far superior in producing symptomatic relief.

A comparison of ergotamine tartrate, dihydroergotamine (DHE-45) and dihydroergocornine (DHO-180) indicated that ergotamine tartrate is the most effective and perhaps the most toxic, DHE-45 is slightly less effective and considerably less toxic, and that DHO-180 is the least effective but also the least toxic. When given orally, these alkaloids were about half as effective as when given by injection. EC-110 (ergotamine nitrate with caffeine) was the most effective.

DHO-180 in liquid form, given daily for one month, had a marked preventive effect on migraine attacks.

It is estimated that 8 per cent of the population of this country, over 10,000,000 persons, have migraine. Of those who have the disease, 61 per cent have family history of it.

During the past decade two important contributions were made to the understanding and treatment of this disease. One was the work of Wolff[16] and his associates who extensively studied the mechanism and localization of migraine. Their conclusions can be stated briefly as follows:

1. Migraine has a biphasic mechanism:

(a) The vasoconstriction or prodromal phase, in which the intracranial vessels (especially some of the branches of the internal carotid artery), are involved, is responsible for scotoma, paresthesia, etc.

(b) Then follows the vasodilatation phase in which the extracranial vessels, chiefly the branches of the external carotid artery, are implicated with concomitant increase in the amplitude of pulsations which corresponds to the actual headache.

2. Pain fibers in the vessel walls and the neighboring part of the meninges are the afferent fibers of the fifth, ninth and tenth cranial and the first three cervical nerves.

3. After the vasodilatation of the vessels has lasted awhile, edema of the vessel wall results, at which time vasoconstrictor drugs can no longer exert an optimum action.

The other major contribution was the introduction of ergotamine tartrate in the treatment of migraine by Stoll and his associates from Basle, Switzerland.

Ergotamine has, unlike other ergot derivatives, a minimal oxytocic and maximal sympatheticoparalytic action. This statement is not equivalent to saying that the latter action is necessarily adequate to control migraine headache. However, as nearly 90 per cent of patients with migraine get some definite benefit from this drug,[3] the statement is fundamentally correct.

Unfortunately this form of symptomatic treatment is not without annoying side-reactions in some cases. Nausea, vomiting and prostration are the chief corollary reactions. The following question then presented itself: How could one eliminate the toxic effect of this drug to allow a larger, expectedly more adequate dosage for the relief of headache?

Stoll, Hofmann and Petrzilka[14] showed that ergotoxin is not a uniform chemical substance but consists of three individual alkaloids, ergocornine, ergocristine and ergocryptine. Hydrogenation of the double bond in the lysergic acid component of these alkaloids yielded dihydroergocornine, dihydroergocristine and dihydroergocryptine. These are known as the dihydrogenated alkaloids of the dimethylpyruvic acid group. The dihydrogenated alkaloids of ergot have pronounced sympathicolytic or adrenolytic action in animals with only slight direct stimulating effect on the smooth muscle.

Rothlin[13] and Brügger[2] found in the isolated seminal vesicle of the guinea pig a method of biological assay to compare the various ergot variants according to their epinephrine-inhibiting effect on that particular preparation. This led to the tabulation of their respective sympathicolytic effects. Using ergotamine tartrate as the basis with a sympathicolytic

---

Chief of Department of Electroencephalography, Cedars of Lebanon Hospital, Los Angeles.

Presented before the Section on Neuropsychiatry at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

The material was furnished through the courtesy of Mr. Harry Althouse of Sandoz Pharmaceuticals, San Francisco, California.

index of one, the other preparations compare with one another in the following manner:

	Index
Ergotamine I—Dihydroergotamine (DHE-45)	7
Ergocornine II—Dihydroergocornine (DHO-180)	25

Due to this especially high sympathicolytic index, dihydroergocornine appeared to be particularly suitable for a clinical trial in the treatment of migraine, and its toxic effect was expected to be far below the previously used ergotamine tartrate and dihydroergotamine methanesulfonate (DHE-45).

MATERIAL

The 40 patients employed for the past two years in this study were carefully selected. The number was believed to be large enough to permit statistical evaluation. The two-year period was estimated to give sufficient time for comparative evaluation of the various drugs. It should be pointed out that all the patients could qualify as having "typical" migraine. The criteria used for selection were:

(a) The absence of organic disease as determined by careful physical and special neurological as well as laboratory work-up supplemented by x-ray of the skull, electroencephalogram and, in some cases, pneumoencephalography.

(b) A family history of "sick headaches."

(c) Recurrent attacks consisting of prodromal manifestations such as nervous irritability, visual disturbances, numbness in certain limbs, and the whole array of phenomena believed to be vasospastic in origin—followed by

(d) Usually unilateral headache accompanied by nausea, vomiting, photophobia.

(e) Ending with rapid elimination of urine and/or sleepiness.

The subjects ranged in age from 17 to 61 years with an average of 33.5 years. The ratio of females to males was four to one. Duration of the periodic headaches ranged from five to 31 years with an average of 11 years. The total monthly headache hours when untreated was 680, or an individual average of 17 hours. This was used as a control. Total number of individual attacks was 127 or an individual average of 3.5 in each month.

It should be pointed out that the author is very much convinced of the importance of the psychological factor in the causation or at least in the precipitation of attacks of headache. The final conclusions of this study, therefore, should not be construed as a recommendation that the only form of therapy in migraine is drug therapy. On the other hand, it is strongly believed that had the study included psychiatric appraisal of these patients, whether for diagnostic or therapeutic purposes, an element of direct or indirect suggestion would have been hard to avoid. However, this would have introduced a new variant in the evaluation of drug therapy, which, after all, was the only objective of this work. The patients were at no time told that any of the treatments would help them, but rather—and this was emphasized—that they *might* or *might not*. The 40 patients, therefore, were submitted to a tedious experimental situation. Six patients were taken out of the series (and others substituted) because of poor cooperation.

Since there are some excellent summaries in the literature concerning the various theories about the mechanism and etiology of migraine—Graham and Wolff,[6] Lennox and von Storch,[9] Palmer[11] and von Storch[15]—these references are eliminated in this presentation. The fact remains that in spite of some very cogent observations and attractive speculations, the etiology of this condition is still not completely known. It is known, however, that thus far only symptomatic management of migraine can be termed as satisfactory.

When this study was begun two years ago, only pharmacological data were available on DHO-180. Since then Popkin[12] reported encouraging results in peripheral vascular diseases. Freis, Stanton and Wilkins,[5] and, more recently Bluntschli and Goetz,[1] have found this drug useful in hypertension and they extensively studied its effect on circulation in man. Imfeld,[8] who worked with a sister preparation (DHE-45), offered the following rationale for the use of the latter drug, which may be worth quoting since it is said that DHO-180 has identical action:

"Such a drug (DHE-45) inhibits the sympathetic stimulation acting upon the end organ or else it depresses the ways of excitation carrying a physiological or pathological sympathetic impulse." Further in the text he observed that "adrenergic stimulants originating not only in the ganglionic chain but also in the peripheral, autonomous, terminal reticulum can be inhibited or depressed."

RESULTS

Previous to the use of ergot preparations, following the method of Friedman and Brenner,[4] the 40 patients were treated with nicotinic acid, 100 mg. intravenously, or with nicotinic acid, 150 mg. in 12 hours by mouth.

The results were as follows:

	Relief	No Relief
Nicotinic acid injected	9	31
Nicotinic acid by mouth	5	35

In order to get a collective impression, the patients were instructed to carefully record the duration of headache. The aggregate result:

	Hours per month	Reduction	Average
No treatment	680		17
Nicotinic acid injected	570	16.2%	14.25
Nicotinic acid by mouth	595	12.5%	14.87

In general it can be said that the severe cases were the least likely to respond to nicotinic acid.

While Wolff's claim that the pre-headache phenomena are due to vasoconstriction of intracranial vessels is generally accepted, it has to be stated that the two phases cannot always be sharply separated, as overlapping of scotoma into headache is not rare and in many patients vasoconstrictor phenomena are not noted at all. Of course it is entirely possible that vessels may be contracting in "silent" areas of the brain. Be that as it may, one would expect prompt abortion of the headache by the use of vasodilators in the constrictor phase. Sixteen of the patients in this series consistently complained of scotoma preceding headache. The administration of nicotinic acid intravenously one-half hour to four hours prior to the expected headache had the following effect:

Abortion of Headache	Mild Headache	No Effect
11	2	3

The patients with mild headache said they felt as if "several layers of headache had been removed." Since it is not common to find patients with constant prodroma of a vasoconstrictor nature, and since persons able to give intravenous injections are not always available, this form of treatment has little practical merit.

Analgesics were also tried. The patients were given tablets containing 0.65 gm. of acetylsalicylic acid and 1.3 gm. of caffeine. They were instructed to start out with two tablets, then one every hour for six doses if necessary. The results were as follows:

Relief	Partial Relief	No Relief
4 (10%)	18 (45%)	18 (45%)

When expressed in monthly headache hours:

Untreated control	680 hours
With analgesics	620 hours, a reduction of 9 per cent

It can be concluded, therefore, that the action of this analgesic manifests itself not so much in shortening the period of headache, which was the case with nicotinic acid, but in making the headache less severe for some patients.

At this point oral and parenteral use of the various ergot preparations, such as ergotamine tartrate, dihydroergotamine methanesulfonate, and dihydroergocornine methanesulfonate, was begun. Results with injectable preparations given for one month each were as follows:

	No. of Patients	Relief Pat's	Relief %	Partial Relief Pat's	Partial Relief %	No Relief Pat's	No Relief %	Toxic (Reaction) Pat's	Toxic (Reaction) %
Ergotamine Tartrate	40	31	77.5	2	5	7	17.5	18	45
DHE-45	40	29	72.5	6	15	5	12.5	6	15
DHO-180	20	10	50	4	20	6	30	2	10

The results with the first two substances are largely in agreement with the already published findings. Ergotamine tartrate gives relief in a higher percentage of cases than does any other drug which has been tried, but the toxicity of it is relatively high. Of the 18 patients who had toxic reaction, seven were in the "relief" category, and the price they had to pay for the relief made discontinuance necessary in five of these seven patients. Toxic effects consisted of nausea, vomiting, weakness, pain in the legs, and dizziness.

DHE-45, although not quite as effective, is definitely less toxic and for that reason has an over-all advantage as compared to ergotamine tartrate. In only one case of the six in which there was toxic reaction were the effects of such an annoying nature as to necessitate discontinuance. Horton, Peters, and Blumenthal[7] reported that DHE-45 was just as effective as ergotamine tartrate, but toxic manifestations were noted three times more frequently with ergotamine than with DHE-45.

DHO-180 is less effective than either of the other two, but it is also the least toxic. In the one case in which toxic effect was shown, circulatory collapse occurred. (The patient responded in the same manner to other injectable ergot alkaloids.)

One conclusion from experience in this investigation was that unless subcutaneous injection of one of these ergot medications achieves control of the headache, this method is not warranted, since partial relief can be obtained by oral medication with less inconvenience. It should be noted also that in this series it was found that if a severe headache was not relieved at the first trial of one or another of these ergot preparations and a repetition within the hour had still no more effect, further trials consistently proved unsuccessful. The efficacy of these medications for an individual patient, therefore, could be canvassed on two trials given as close to the onset of headache as possible.

ORAL ERGOT ADMINISTRATION

When the ergot preparations were given orally, two types of dosage schedules were used, with half of the patients following one schedule and half the other, but a breakdown of the figures does not show a significant difference between results obtained by the two schedules. The patients were instructed to take the medication at the first manifestation of headache. Those patients who were unable to swallow the first large dose of ergot alkaloid because of nausea or vomiting were given another trial and if nausea persisted they were given ergot preparations subcutaneously, but the results are not included in the data on results (Table 1).

The schedules were as follows:

Schedule A

Drug	Initial Dose (mg.)	Subsequent Half-hour Dosage (mg.)	Maximum Total Dose (mg.)
Ergotamine tartrate	3	1	6
DHE-45	6	2	10
DHO-180	4	3	10
EC-110*	3	1	6

Schedule B

Drug	Initial Dose (mg.)	Subsequent Half-hour Dosage (mg.)	Maximum Total Dose (mg.)
Ergotamine tartrate	5	1	8
DHE-45	8	2	12
DHO-180	6	2	12
EC-110	4	1	8

While the series was not large enough to permit far-reaching statistical evaluation, it can be concluded with safety that by and large the oral administration in the manner it was given was roughly half as successful as the subcutaneous use of the (first three) substances. While incidence of toxic manifestations was rather high, the reactions were much milder in nature and even negligible; they

---

*Composition: 1 mg. ergotamine tartrate with 100 mg. caffeine.

TABLE 1.—*Results with Oral Administration of Ergot Preparations*

(20 patients followed Schedule A and 20 Schedule B)

Drug	Schedule	Relief		Partial Relief		No Relief		Toxic Reaction	
		Patients	%	Patients	%	Patients	%	Patients	%
Ergotamine	A	7	35	6	30	7	35	6	30
tartrate	B	8	40	6	30	6	30	7	35
DHE-45	A	10	50	2	10	8	40	4	20
	B	12	60	4	20	4	20	4	20
DHO-180	A	10	50	2	10	8	40	2	10
	B	12	60	3	15	5	25	5	25
EC-110	A	11	55	5	25	4	20	2	10
	B	12	60	0	0	8	40	7	35

consisted chiefly of transient weakness, nausea and palpitation. No interruption was necessary and these side-effects were frequently absent on subsequent trials.

Comparison of the individual variants of the ergot alkaloid shows that ergotamine tartrate, given orally, was the least successful in producing relief but that partial relief was the highest with this drug. The other three were rather alike in their action, with EC-110 somewhat better than the rest. When EC-110 was given according to Schedule B and only when patient had an oncoming attack, by-effects were noted, consisting of light-headedness and palpitation. This was probably the result of the caffeine in that preparation. Roughly 50 to 75 per cent of patients got relief, total or partial, with one schedule or the other.

An interesting observation was that in a group of five patients who had several migraine attacks in one week, less and less DHO-180 was needed in successive attacks which were of equal intensity. This was not the case with other medications. On the other hand, in the group of patients who were treated with ergotamine and got no relief, there were three who had headache with greater frequency as time went by.

At this stage of the study DHO-180 was supplied in liquid (drop) form, each cubic centimeter containing 1 mg. of dihydroergocornine methanesulfonate, which permitted greater flexibility of dosage. Inasmuch as the toxicity of this drug when given according to Schedule A was low, and in view of the previously mentioned observation of decreasing need in subsequent attacks, this medication was given daily for one month in order to find out whether headaches could be prevented or the frequency of occurrence reduced. All 40 patients were used for this purpose. The individual dose was 5 to 20 drops thrice daily, but it was found that 10 to 15 drops was the most effective.

The results calculated in headache hours demonstrated pronounced reduction: In the untreated control the monthly total of headache hours was 680; when DHO-180 was given, 30 drops daily in three equal doses, headache hours aggregated 140 monthly, or a reduction of 79.4 per cent. When migraine attacks did occur they were in all cases milder.

When the drops were given according to Schedule A, the results were somewhat different, in that 32 of the 40 patients were completely or greatly relieved while five were not relieved. In aggregate, the frequency of attacks was reduced and headache was milder with fewer and less pronounced associated symptoms, although individually the attacks lasted as long as they ever did. Eleven patients had their first attack-free month in several years, although the following month they may have had recurrence.

As it was important to determine whether the same results could be obtained with some of the other ergot preparations, the whole group was given DHE-45 (dihydroergotamine) in tablets, each containing 2 mg., with a dosage schedule of one tablet thrice a day. The monthly total of headache hours was 510, a reduction of 25 per cent from the control total, as compared with the reduction of 79.4 per cent obtained with DHO-180.

Lennox[10] in 1934 demonstrated that daily administration of ergotamine tartrate had little or no effect. No effect was observed with 3 mg. daily and only a few attacks were skipped with 9 mg. daily. However, sublingual administration of this drug has proven effective in some cases. Now DHE-45 is added to the list of ergot preparations with a moderate preventive effect. DHO-180 appears to be, therefore, the first ergot variant which has something like a preventive effect on the frequency of migraine.

This effect of DHO-180 cannot be explained easily or completely. In view of the high epinephrine-inhibiting index (25 with that of ergotamine tartrate taken as 1) it can be postulated that the effect is essentially sympatheticoparalytic, leading to an improvement of the vascular tone. Popkin demonstrated this effect in peripheral vessels by the improvement of color and increase in skin temperature of patients, and the duration of this reaction was three to four hours. There is no reason why a similar condition cannot occur in the vessels within and outside the cranium. Once the vascular tonus is improved, the vessels would be able to better resist the assault of whatever noxious stimuli there may be to unleash an attack of migraine. This protection is not complete, since some migraine did occur, but obviously a threshold effect seems to have been obtained. That the explanation is not simply one of inhibition of sympathetic action is demonstrated by the fact that the dihydrogenated ergot alkaloids in some cases produce favorable results in vasospastic conditions of the leg and of the head in patients in whom the sympathetic nerve supply has been surgically interrupted. That there cannot be any pain threshold-raising factor operating on pain mediating fibers of vessels was shown by Wolff, Hardy and Goodell,[17] who were unable to demonstrate such effect with their method when using ergotamine tartrate. The difficulty of explaining this action of DHO-180 is no different from the difficulty of accounting for the mechanism of migraine, which is still not completely understood.

There is still no explanation for the coexistence of scotoma and pulsating headache which would indicate vasoconstriction in the branches of the internal carotid artery concurrent with vasodilatation in the branches of the external carotid artery. The difficulty of influencing these opposite mechanisms simultaneously is obvious. Both mechanisms, when extreme, may press upon pain fibers in the vessel wall and cause headache. Edema of the vessel wall after prolonged dilatation when the migraine is refractory to ergot medication has already been mentioned.

These are only a few factors impeding the final solution of the migraine problem.

REFERENCES

1. Bluntschli, H. J., and Goetz, R. H.: The effect of ergot derivatives on the circulation in man with special reference to two new hydrogenated compounds (Dihydroergotamine and Dihydroergocornine), Am. Heart J., 35:873-894, June 1948.

2. Brugger, J.: Die isolierte Samenblase des Meerschweinchens als biologisches Testobjekt zur quantitativen Differenzierung der sympathikolytischen Wirkung der genuinen Mutterkornalkaloide und ihrer Dihydroderivate, Helv. Physiol. Acta. 3:117-134, 1945.

3. Dannenberg, T. B.: Comparison of dihydroergotamine, ergotamine and other agents in the treatment of migraine, Permanente Foundation Med. Bulletin, 4: July 1946.

4. Friedman, A. P., and Brenner, Ch.: Treatment of the migraine attack, Am. Practitioner, 467-470, March 1948.

5. Freis, E. D., Stanton, J. R., and Wilkins, R. W.: The effects of certain dihydrogenated alkaloids of ergot in hypertensive patients, Am. J. Med. Sciences, 216:163-171, August 1948.

6. Graham, J. R., and Wolff, H. G.: Mechanism of migraine headache and action of ergotamine tartrate, Arch. of Neurol. and Psychiat., 39:737-763, April 1938.

7. Horton, B. T., Peters, G. A., and Blumenthal, L. S.: A new product in the treatment of migraine, Proc. Staff Meet. Mayo Clinic, 20:241, July 11, 1945.

8. Imfeld, J. P.: Erste klinische Erfahrungen mit Dihydroergotamin (DHE-45), Schweiz, Med. Wochenschr., 76:1263, December 1946.

9. Lennox, W. G., and von Storch, T. J. C.: Experience with ergotamine tartrate in 120 patients with migraine, J.A.M.A., 105:169-171, July 20, 1945.

10. Lennox, W. G.: The use of ergotamine tartrate in migraine, New Eng. J. Med., 210:1061-1065, May 17, 1934.

11. Palmer, H. D.: Migraine headache, Clinics, 4:531, 1945.

12. Popkin, Roy J.: Personal communication.

13. Rothlin, E.: The pharmacology of the natural and dihydrogenated alkaloids of ergot, Bull. de l'Academie Suisse des Sciences Medicales, 2: 1946-7.

14. Stoll, A., Hofmann, A., and Petrzilka, Th.: Die Dihydroderivate der rechtsdrehenden Mutterkornalkaloide, Helv. Chim. Acta, 29:635-653, 1936.

15. Von Storch, T. J. C.: On the treatment of migraine, Med. Clin. N. Amer., 25:1317, 1941.

16. Wolff, H. G.: Headache and Other Head Pain, Oxford University Press, 1948.

17. Wolff, H. G., Hardy, J. D., and Goodell, H.: Measurement of the effect on the pain threshold of acetylsalicylic acid, acetanilid, acetophenetidin, aminopyrine, ethyl alcohol, trichlorethylene, a barbiturate, quinine, ergotamine tartrate and caffeine: An analysis of their relation to the pain experience, J. Clin. Invest., 20:63-80, January 1941.

Discussion by Robert B. Aird, M.D., *San Francisco*

The contributions of Dr. Bercel's study would appear to me to be as follows:

(1) The results with parenteral injections strongly suggest that DHO-180 is considerably less effective in the relief of migraine headaches than either of the older ergotamine preparations, that is, the tartrate or DHE-45. Although slightly more toxic than DHO-180, the DHE-45 compound gave appreciably better results than DHO-180. Although essentially as effective as ergotamine tartrate, DHE-45 was considerably less toxic. The practical import of this is that Dr. Bercel's results would appear to indicate that DHE-45 is the best all-around agent of the group for the relief of migraine. This is in agreement with our own observations and other reports, such as those of Horton and his coworkers. In making this point, it should be understood that such a statement has little significance insofar as the individual patient is concerned. What is best for one patient may be ineffective for the next.

(2) The studies on the oral administration of the ergotamine derivatives are also noteworthy in showing that EC-110, which is ergotamine tartrate in combination with caffeine, gave the most relief with the minimum of toxicity when used conservatively as indicated in "Schedule A."

(3) Dr. Bercel's most noteworthy contribution, however, is concerned with his observation on the prophylactic effect of DHO-180 upon migraine headaches when given regularly in doses of from 10 to 15 drops thrice daily.

With regard to the physiological mechanisms underlying migraine, I believe it is fair to postulate a vasoconstriction of the terminal branches of the internal carotid artery as being the primary event in a high percentage of cases, if not in all. That Dr. Bercel could abort migraine attacks partially or completely in 13 of 16 patients seems to me to be a striking point. In clinical studies one does not expect much better results than this. Considering one's inability to control all factors, as for example the possibility that an intravenous injection given relatively late might not be effective in aborting an attack, Dr. Bercel's positive results in 13 of 16 patients would seem to substantiate the point that vasoconstriction is the primary event in the abnormal physiology of migraine. Such a peripheral vasoconstriction intracranially would shunt considerable amounts of blood through the other main branch of the carotid artery. The dilatation and stimulus of this might be expected to initiate the strong pulsations of the branches of the external carotid, which in turn would stimulate the pain-sensitive fibers in the blood vessel walls and result in the unilateral, throbbing pain typical of migraine. Since the shunting effect would occur concomitantly with intracranial vasoconstriction, it is not surprising that the migraine attack might begin while the cerebral manifestations of vasoconstriction were still apparent in some patients, as may be observed occasionally and as was noted by Dr. Bercel. The prolongation of the migraine attack and ineffectiveness of the ergotamine derivatives when given late is best explained, as Dr. Bercel has stated, by the edema of the vessel wall and the perivascular swelling which has been termed "pipe-stem" arteries. This aspect of the problem has interested me a great deal inasmuch as this perivascular and edematous reaction would appear to be the result of, or associated with, an increased permeability of the vascular wall. In certain cases of headache, injections of the supra-vital dye, Trypan Red, have been beneficial. Since this dye stains the endothelial cells and tends to lower vascular permeability, its beneficial effect is presumably due to its action in aborting this perivascular and edematous reaction.

Undescended Testes

W. H. Snyder, Jr., M.D., William Van Valin, M.D., and
Lawrence Chaffin, M.D., *Los Angeles*

SUMMARY

Orchiopexy was performed upon 152 patients. Follow-up observation was inadequate, but of known results 14 per cent were poor.

As an increasing number of investigators have observed spontaneous descent of undescended testes, this possibility should be considered in weighing indications for operation on boys before the age of puberty. Coexisting clinically demonstrable hernia (59 per cent in this series) is an indication for early operation. Otherwise, orchiopexy may be best delayed, perhaps until the twelfth year. This was done in 25 per cent of the cases in this series.

Three methods of operation were used, the Torek, the Cabot-Nesbit, and the Bevan. There were fewer poor results with the Torek than with the Cabot-Nesbit procedure. The greatest number of poor results was in cases in which the Bevan technique was used.

A STUDY was made of 160 consecutive patients operated upon for undescended testes at the Los Angeles Children's Hospital in the period 1937-1947. In four cases it was necessary to excise the testis, either for gangrene or suspected tumor; in four others no testicular tissue was found. This made a total of 152 patients on whom orchiopexy was performed. Results following orchiopexy were classified as good in 86 per cent and poor in 14 per cent. This appraisal is by no means final, as many patients did not return for follow-up studies. A result was considered to be good if the testis was well into the scrotum and definitely palpable three weeks after discharge. It is recognized, however, that these are inadequate criteria.

As the results of operations were far from perfect, the indications for operation were reviewed. It was found that the incidence of undescended testes is four times as great in boys as in men (Table 1). Furthermore, from the reports of many recent investigators it appeared that in about 50 per cent of boys with cryptorchism who were kept under observation there was spontaneous descent (Table 2). Non-descent, per se, does not greatly alter the production of the male sex hormone nor the normal development of the secondary sex characteristics.[6, 20, 11, 21]

These facts indicate that in cases of simple undescended testis, operation probably should not be done until puberty. However, early operation is indicated in the presence of clinically demonstrable concomitant hernia. (Of the 51 patients under eight years of age in the series here reviewed, all but six had accompanying hernia.)

In the older children in this series endocrine therapy was given a thorough trial before operation was done; 76, or 47 per cent, were given one or more courses of chorionic gonadotropic hormone (250 units injected bi-weekly for a total of 30 injections) without success. These unfavorable results and those reported in the literature[15, 8, 23, 16, 29, 27] have led the authors to discard this method in routine management. It cannot be denied, however, that it does produce early puberty and, along with this development, descent of the testes in about 25 per cent of cases, according to some observers.[29] It is generally agreed that if endocrine therapy fails, operation without delay is indicated because tubule degeneration may develop in its wake.[10, 16]

Table 1.—*Incidence of Undescended Testes in Boys and Men*

Reported by	Number Examined	Number with Undescended Testes	Incidence
BOYS			
Drake[9]	1,060	38	3.3%
Williams[35]	2,104	59	2.8%
Johnson[14]	31,000 (approx.)	544	1.7%
Smith[28]	2,000 (approx.)	50	2.5%
		Average	2.2%
MEN			
Marshall, 1828	10,800	110	1.02%
Zeibert,[37] 1898	6,962,543	14,057	0.2%
U.S. War Dept.,[32] 1920	3.1 per 1,000 drafted men		0.31%
Baumrücker[2]	10,000	79	0.8%
		Average	0.58%

Table 2.—*Spontaneous Descent of the Testicle in Boys as Reported by Various Investigators*

Reported by	Age of Boys	No. of Patients Followed	No. with Spontaneous Descent	Percentage of Spontaneous Descent
Drake,[9] 1934	3-19	38	24	64
Harris,[12] 1935	3-19	45	11	24
Williams,[35] 1936	3-15	59	38	64
Johnson,[14] 1939	3-17	544	300	55
Smith,[28] 1941	8-20	50	27	54
Mimpriss,[19] 1945	10-14	50	25	50
Totals		766	425	55

From the Surgical Department of the University of Southern California, and the Children's Hospital, Los Angeles, California.

Presented before the Section on General Surgery at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

Most observers[15, 8, 33, 7] are agreed that operation should be performed at about the eighth to tenth year; yet some[17, 5, 24] feel that it is indicated earlier, while others[23, 16, 28, 26] favor longer delay. There is general agreement that in all cases in which the testes remain in the undescended position, operation should be done not later than puberty.[23, 16, 19, 25]

Having in mind the desirability of correcting the deformity, knowing the limitations of hormone therapy, recognizing the advantages of early repair of hernia, cognizant that in a certain percentage of cases the testes will descend spontaneously before puberty, and informed of the dangers of delay past puberty, the staff of the Children's Hospital has arranged for operation at an average age of nine years. Forty patients (25 per cent) were not operated upon until the twelfth year or later. The reviewers of this work offer no criticisms except to state that in some cases in which there is no clinical evidence of hernia, postponement of orchiopexy until the twelfth year, or later, may be preferable to the present practice.

OPERATIVE TECHNIQUE

There are three basic operative procedures which have been used in this clinic: Bevan's operation,[3] the Cabot-Nesbit technique,[7] and the Torek operation.[30] These techniques are illustrated (Figures 1, 2, 3, and 4) to show the basic principles involved but not the details.

Bevan emphasized the need for careful freeing up of the cord including the vas deferens and the vascular components at their emergence from the abdomen and throughout their passage in the canal. He felt that if it was adequately done, and if a pocket was made in the rudimentary scrotum and the testis placed in it, this was enough. Fixing the tissues below the external ring and, at times, anchoring the testicle to the bottom of the scrotum are included as a part of the Bevan technique.

The Cabot-Nesbit technique adds to the Bevan procedure the principle of traction applied to the testis from the thigh. Sutures are passed into the testis through the scrotum and down the thigh. They are then attached to a rubber band which, in turn, is fixed to the thigh with adhesive tape. Figure 3 illustrates the technique followed in this clinic. The same principle may be utilized more simply but, perhaps less effectively, by passing the sutures from the testicle through the scrotum directly to the skin of the thigh. This is looked upon as a modification of the Cabot-Nesbit technique, although actually it antedated this procedure.

Torek's operation actually fixes the testicle to the fascia of the thigh. An incision must be made through the base of the scrotum and another one through the skin of the thigh. The testis is sutured directly to the fascia, and the skin of the thigh and scrotum united. After an interval of a few months, a simple second-stage operation releases the testis and scrotum from the thigh. There are many minor variations or modifications of this technique. Wangensteen,[34] for instance, leaves a layer of the tunica vaginalis communis between the testis and the fascia of the thigh. Mimpriss[19] also avoids suturing the testis or albuginea directly to the fascia of the thigh.

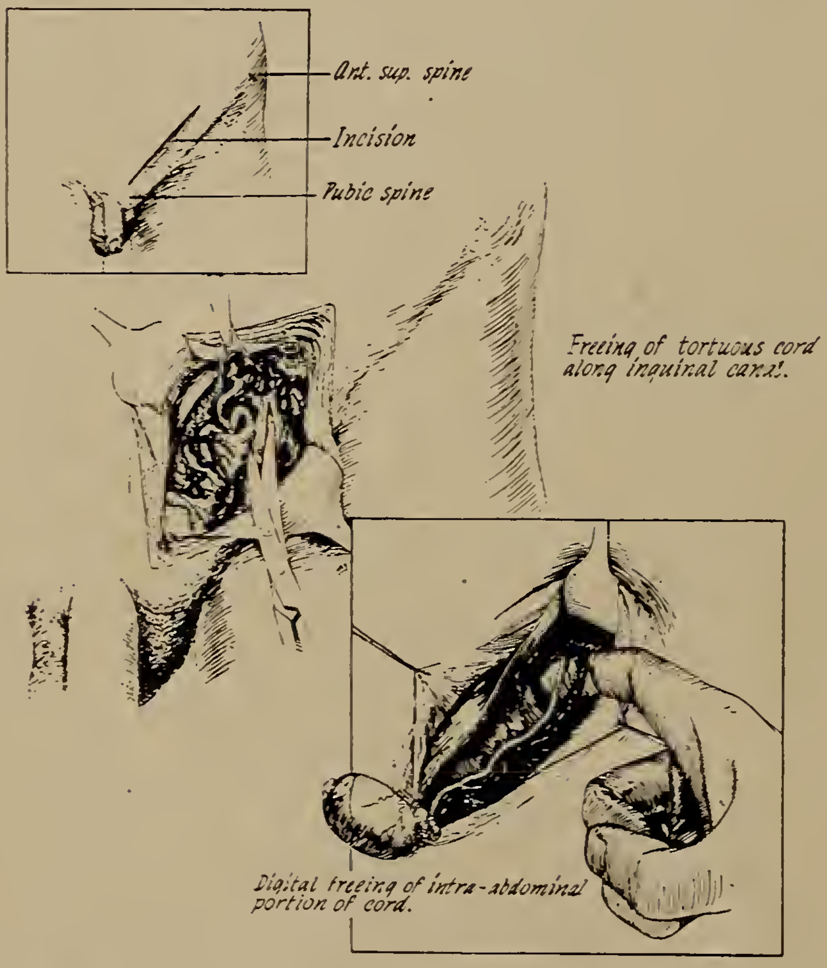

Ant. sup. spine
Incision
Pubic spine
Freeing of tortuous cord along inguinal canal.
Digital freeing of intra-abdominal portion of cord.

Figure 1.—Fundamentals in the preliminary steps in the Bevan technique.

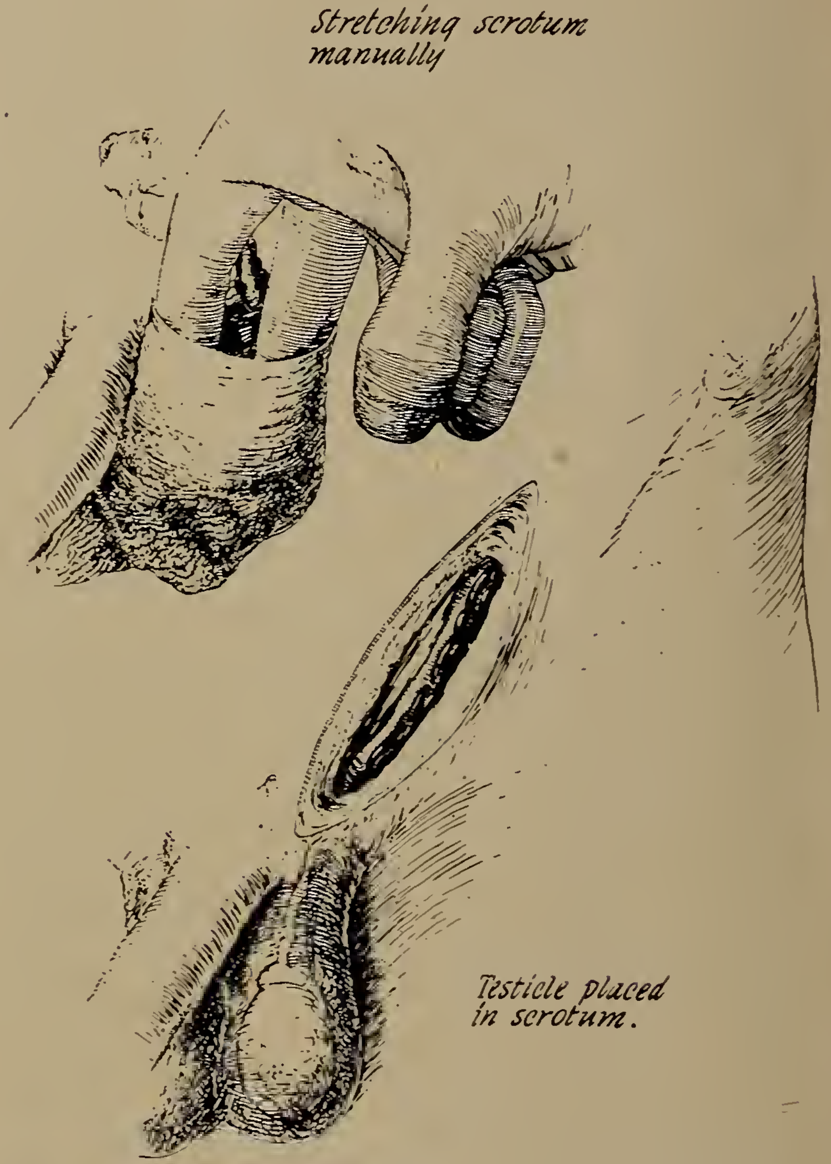


Figure 2.—Fundamentals in the final steps in the Bevan technique.

One other technical procedure should be mentioned. In 1934, Ada[1] suggested a three-stage Torek operation for use in those cases in which the testes could not be brought into the scrotum because of too short a cord. The basic principles involved in this procedure had been suggested previously by Cabot.[7] They consist of performing the initial steps in the orchiopexy and fixing the testis as far down in the canal as possible, usually at the pubis. Then, at the second stage, some months or a year later, descent is completed and the testis attached to the thigh in the bottom of the scrotum. The third and final stage is identical with the second stage of the usual Torek procedure. This method was used for five patients in the present series. Thus far, however, only one of the five has returned for the final stage. This is believed to be a sound technique and, for the unusual case in which the standard Torek operation cannot be initially applied because the cord is too short, a far better procedure than excising the testis or replacing it in the abdomen.

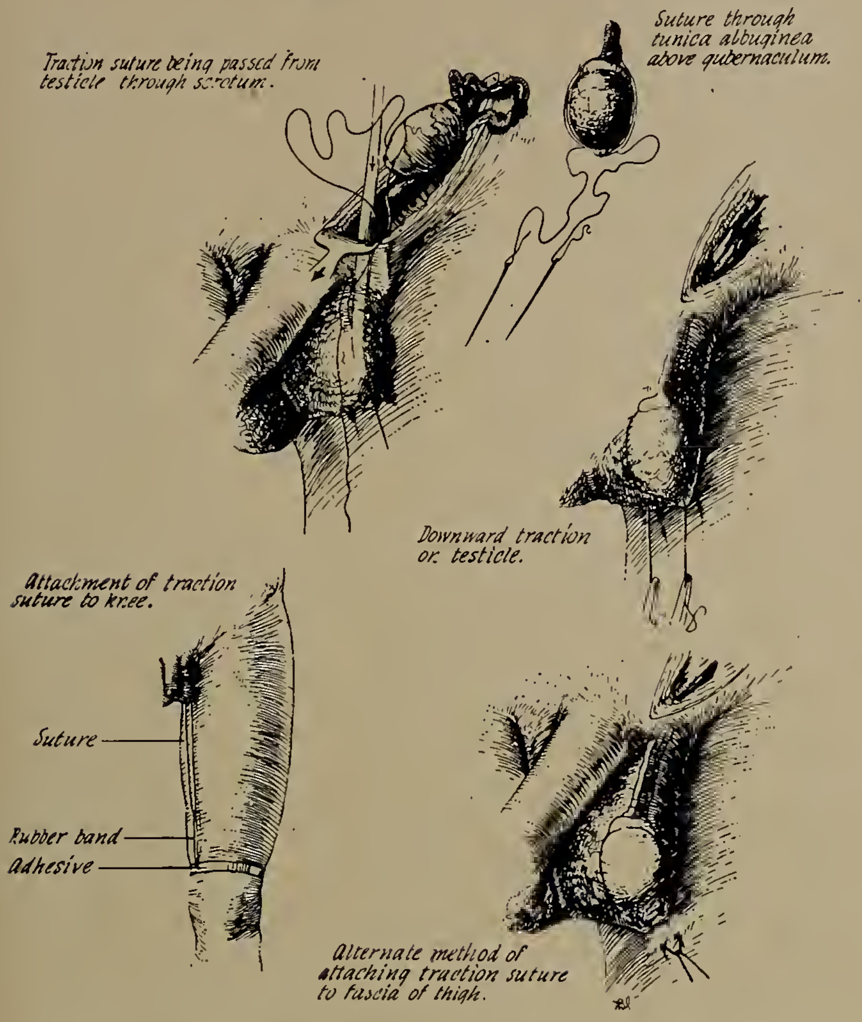

Traction suture being passed from testicle through scrotum.
Suture through tunica albuginea above gubernaculum.
Downward traction on testicle.
Attachment of traction suture to knee.
Suture
Rubber band
Adhesive
Alternate method of attaching traction suture to fascia of thigh.

Figure 3.—Fundamentals in the Cabot-Nesbit technique.

RESULTS

Bevan's procedure alone, without utilizing the principles of traction or fixation to the thigh, was used in 40 cases in the series. The highest incidence of poor results was in this group. This is in accord with the experience of other observers.[18, 12] Results in 12 cases (30 per cent) are known disappointments; either at discharge or in follow-up studies the testes were found to be at the pubic spine or in the canal. This method was used more frequently in years past than now. It seems adequate in some cases in which the cord is long and the testis almost falls into position. Rarely would the authors recommend it as the procedure of choice.

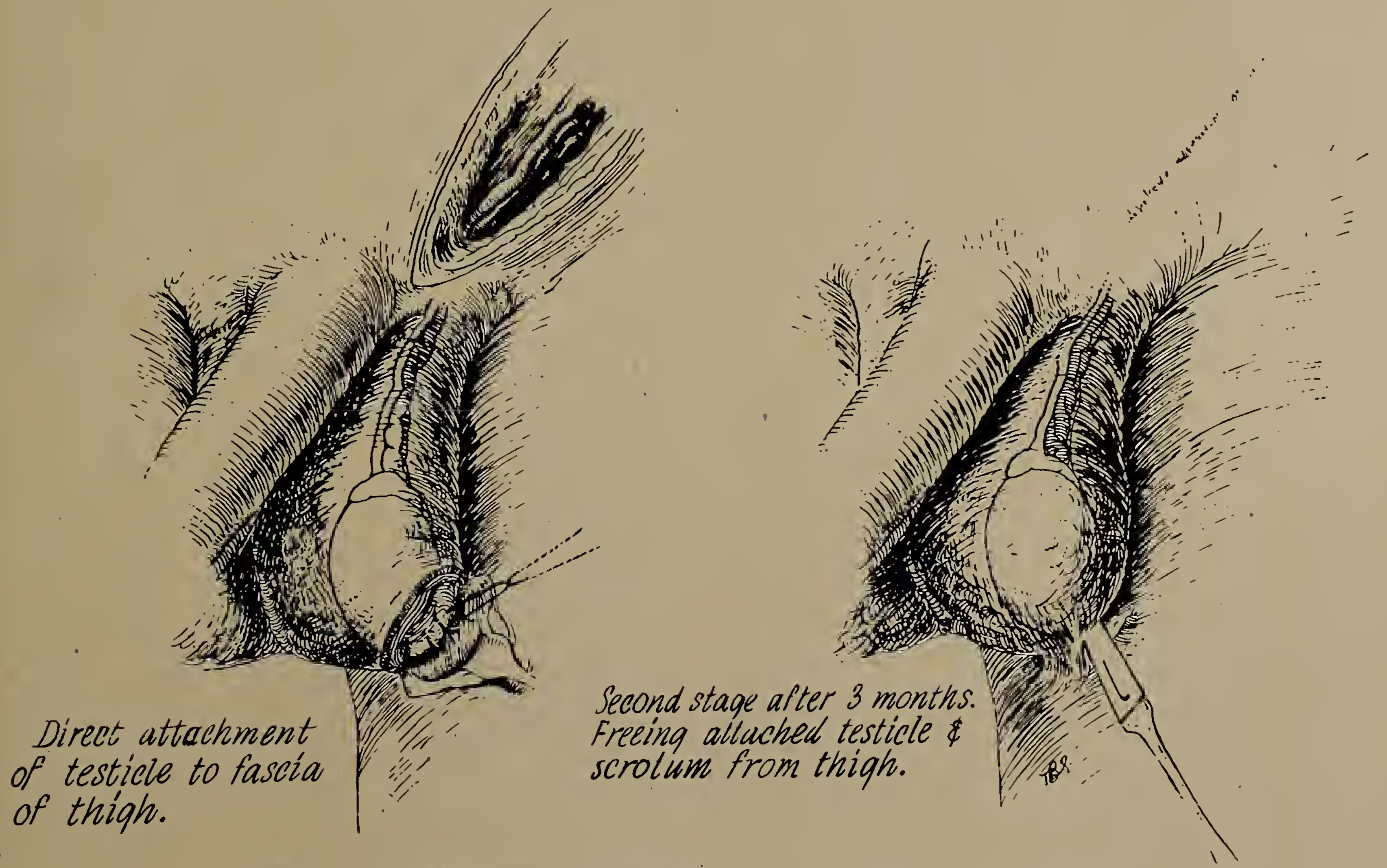

Direct attachment of testicle to fascia of thigh.
Second stage after 3 months. Freeing attached testicle & scrotum from thigh.

Figure 4.—Fundamentals of the Torek technique.

Results with the Cabot-Nesbit procedure were definitely better than those obtained with the Bevan technique. This method, or a modification of it, was used in 55 cases. Instead of a rubber band to produce traction, a chromic suture was passed directly into the fascia of the thigh in some cases. There were six known poor results following this technique.

There were only two known poor results following the Torek operation, which was used in 51 cases. The only important modification of Torek's original procedure is that advocated by Wangensteen,[34] Mimpriss[19] and others—namely, to leave the tunica vaginalis communis between the testis and the fascia of the thigh. The authors feel that this modification, although having some advantages in protecting the testis and making the second stage easier, may not make so safe and secure an attachment for the testis.

Comparison of results obtained with each of the three procedures indicates that the Torek operation is most likely to be entirely satisfactory, that the Cabot-Nesbit technique is a close second and that the Bevan operation is least often successful. Since the Cabot-Nesbit technique is a one-stage procedure, it does have some advantages over the Torek operation, which must be done in two stages. For one thing, fewer days of hospitalization were required when the Cabot-Nesbit procedure was used. The average number of days spent in the hospital with the Torek operation was 22, with Cabot-Nesbit 15, and with Bevan 16. There were too few cases to warrant comparison of the refinements in technique.

INCIDENTAL DATA

In this series, cryptorchism was right-sided in 90 cases (56 per cent), left-sided in 53 (32 per cent) and bilateral in 17 (11 per cent). In no case of bilateral abdominal testes was an exploratory laparotomy performed, as advocated by Lowsley[17] and Young.[36] The incidence of Frohlich syndrome was not tabulated although it must be considered in the general problem of cryptorchism. There were no deaths in this series. Postoperative infection occurred in some cases but was never serious.

7046 Hollywood Boulevard.

REFERENCES

1. Ada, A. E. W.: Advantages and applicability of Torek orchiopexy for undescended testis, Am. J. Surgery, 23:133, Jan. 1934.

2. Baumrucker, G. O.: Incidence of testicular pathology in undescended testes, U. S. Army M. Dept. Bull., 5:312, March 1946.

3. Bevan; A. D.: Operation for undescended testicle and congenital inguinal hernia, J.A.M.A., 33:773, Sept. 23, 1899.

4. Bevan, A. D.: Surgical treatment of undescended testicle, J.A.M.A., 41:718, Sept. 19, 1903.

5. Bevan, A. D.: Operation for undescended testicle, Trans. Am. Surg. Assn., 47:314, May 1929.

6. Bouin, P., and Ancel; P. B.: Researches on the interstitial cells of the testicle of mammals, Arch. de Zool. Exp. et Gen., 4th ser., Paris, 1:437, 1903.

7. Cabot, H., and Nesbit, R. M.: Undescended testis; principles and methods of treatment, Arch. Surg., 22:850, May 1931.

8. Cone, R. E.: Surgical management of cryptorchidism, Ann. Surg., 119:591, April 1944.

9. Drake, C. B.: Spontaneous late descent of testis, J.A.M.A., 102:759, March 10, 1934.

10. Eisenstadt, J. S., Appel, M. E., and Fraenkel, M.: Effect of hormones on undescended testis: experimental and clinical study, J.A.M.A., 115:200, July 20, 1940.

11. Hanes, F. M., and Hooker, C. W.: Hormone production in undescended testis, Proc. Soc. Exper. Biol. and Med., 35:549, Jan. 1937.

12. Harris, F. I.: Treatment of undescended testis with particular reference to endocrine therapy and Torek operation, Am. J. Surg., 27:447, March 1935.

13. Higgins, C. C., and Welti, H.: Surgical treatment of undescended testicle, S. G. & O., 48:536, April 1929.

14. Johnson, W. W.: Cryptorchidism, J.A.M.A., 113:25, July 1, 1939.

15. Ladd, W. E., and Gross, R. E.: Abdominal Surgery of Childhood, W. B. Saunders and Co., 1941.

16. Lapin, J. H., Klein, W., and Goldman, A.: Cryptorchidism, Jour. Pediatrics, 22:175, Feb. 1943.

17. Lowsley, O. S., and Kirwin, T. J.: Clinical Urology, Williams and Wilkins Co., p. 387, 1944.

18. MacCollum, D. W.: Clinical study of spermatogenesis of undescended testicles, Arch. Surg., 31:290, Aug. 1935.

19. Mimpriss, T. W.: Treatment of retained testis, Proc. Roy. Soc. Med., 38:507, July 1945.

20. Moore, C. R., and Gallagher, T. F.: Seminal vesicle and prostate function as testis-hormone indicator, Am. J. Anat., 45:39, Jan. 1930.

21. Nelson, W. O.: Effect of gonadotropic hormone injections upon hypophyses and sex-accessories of experimental cryptorchid rats, Proc. Soc. Exper. Biol. and Med., 31:1192, 1933-1934.

22. Ombredonne, L.: Orchiopexy in infants, Gaz. Med. de France, 2:118, March 15, 1928.

23. Ormond, J. K., Cothran, R. M., and Singiser, J. A.: Operation for undescended testicle; report of series of cases, Jour. Urol., 53:602, April 1945.

24. Rankin, L. M., and Eger, S. A.: Advantages of early operation in undescended testis, Am. J. Surg., 57:183, July 1942.

25. Rea, C. E.: Histological character of undescended testis after puberty; its significance in reference to performance of orchiopexy, Arch. Surg., 44:27, Jan. 1942.

26. Rieser, C.: Treatment of retained testicle, Southern Surg., 11:90, Feb. 1942.

27. Shelton, E. K.: Discussion of Thompson, W. O., and Heckel, N. J., article.[29]

28. Smith, R. E.: Undescended testicle, Lancet, 1:747, June 14, 1941.

29. Thompson, W. O., and Heckel, N. J.: Undescended testes; present status of glandular treatment, J.A.M.A., 112:397, Feb. 4, 1939.

30. Torek, F.: Technique of orchiopexy, New York Med. Jour., 90:948, Nov. 1909.

31. Torek, F.: Orchiopexy for undescended testicle, Ann. Surg., 94:97, July 1931.

32. War Dept. Report, Washington, D. C., 1920, p. 164: Defects found in Drafted Men. Cited by Gilbert, J. B., and Hamilton, J. B.: S. G. & O., 71:731, Dec. 1940.

33. Wangensteen, O. H.: Undescended testis; experimental and clinical study, Arch. Surg., 14:663, March 1927.

34. Wangensteen, O. H.: Surgery of undescended testis, S. G. & O., 54:219, Feb. 1932.

35. Williams, P.: Imperfectly migrated testis, Lancet, 1:426, Feb. 22, 1936.

36. Young, H. H.: An intra-abdominal operation for cryptorchidism, Trans. Am. Assn. Gen. Urin. Surg., 35:115, May 1942.

37. Zeibert, K. A.: Ueber Kryptorchismus und seine Behandlung, Diss., Heidelberg, 1898. Quoted by Cabot, H., and Nesbit, R. M.[7]

CASE REPORTS

- A Case of Acute Porphyria: Remissions Induced with Procaine Intravenously
- Bile Peritonitis Due to Spontaneous Rupture of a Dilated Intrahepatic Duct

A Case of Acute Porphyria: Remissions Induced With Procaine Intravenously

H. A. Grubschmidt, M.D., *Santa Rosa*

In the case of acute porphyria here reported there was the rapid dramatic response on three separate occasions to the administration of intravenous procaine with disappearance of signs and symptoms.

CASE REPORT

The patient, a 27-year-old white housewife, was admitted to hospital on February 1, 1947, with a note from a physician stating she had acute porphyria. In May 1944, four months after the birth of her second and last child, she had had an attack of cramping lower abdominal pains resembling those present during menses and associated with nausea and vomiting. These lasted a week and were relieved with catamenia. A similar attack occurred in November 1944. The patient did not menstruate again until four months later and this also was preceded by an attack lasting two weeks. A similar episode occurred two months later. Hysterectomy was performed in May 1945 (details not obtainable). Abdominal pains with nausea and vomiting recurred in January 1946, and the patient was hospitalized for five weeks. Treatment with an undetermined amount of male hormone parenterally, several times per month, was begun and maintained until September 16, 1946. At this time the patient had recurrence of previous symptoms associated also with low back pain. Deep x-radiation was directed to the ovaries in October 1946 for "endometriosis." As the symptoms continued undiminished, the patient entered Meadowbrook Hospital.

During various periods of the present illness the urine had varied in color from amber to pink to dark red or brownish black. At the time of the present admission the patient had been constantly in bed for six weeks and she weighed 83 pounds, as compared with her "best" weight of 115 pounds and with an average of 103 pounds. She complained of anesthesia of the inner aspects of the thighs and perineal region, difficult urination, extreme weakness of the lower extremities and aching in the back and lower abdomen.

Parents and siblings were living and well and there was no history of overt similar attacks. The patient's general health had always been good except for measles, mumps, chicken pox and pertussis in childhood. Appendectomy had been performed nine years previously with no recurrence of similar symptoms. The patient denied the more obvious allergic stigmata for herself and immediate family. Menarche appeared at the age of 11 years and menstrual periods came on irregularly, the rhythm steadying after marriage. Early in married life she was treated for "infantile uterus" with injections to facilitate conception. Pregnancy occurred in the fourth year of marriage and was associated with hypertension, edema and scotomata. A living, full-term, normal male infant had been delivered. Two years later the patient became pregnant again, had similar toxemic symptoms, and was delivered of a living, full-term, normal female infant. Symptoms of painful menstruation and occasional "fainting" during menses ceased after the first pregnancy.

During periods of remission of the present illness, the patient never felt quite well, complained of weakness and always seemed to be lacking in energy. From time to time she had mild to moderate abdominal pain, nausea and vomiting and voided dark urine. Photosensitivity was denied.

Upon physical examination it was noted that the patient apparently was normally developed but poorly nourished. In the facies, haggardness and an anxious expression were observed. The patient tossed and turned ceaselessly in bed, complaining and crying out frequently about pain in the low back and abdomen. Examination was interrupted frequently by retching and vomiting. The oral temperature was 99.4° F., respirations were 24, pulse 70, and the blood pressure was 158 mm. of mercury systolic and 116 mm. diastolic. The mouth and lips were dry, the pupils dilated but reactive to light, the optic nerve heads seemed normal and the retinal arterioles showed a mild degree of localized narrowing. The teeth were carious and the tonsils small. The lungs were clear and the abdomen scaphoid, with tenderness in both lower quadrants, together with slight rebound tenderness. The spleen was felt at the costal margin. There was tenderness to percussion in both costovertebral angles. In pelvirectal examination a cervical stump was noted. Knee and ankle jerks were not obtainable even with reenforcement, and the biceps and triceps reflexes were hypoactive. There was considerable diminution of sensation to light touch and pinprick over both lower extremities and the perineum with pronounced muscular weakness.

The hemoglobin value of the blood was 103 per cent and leukocytes numbered 13,800 with 78 per cent polymorphonuclear cells. Results of chemical analysis of the blood were within normal limits except for total cholesterol of 450 mg. per 100 cc. and cholesterol esters of 150 mg. per 100 cc. The urine was acid in reaction and there was a trace of albumin; 10 to 20 leukocytes per high power field were noted.

With the patient at bed rest, on a high caloric diet and receiving codeine, Demerol,® Lockwood's solution, paraldehyde, placebos and intravenous fluid, there was no abatement of symptoms in eight days. Barbiturates were withheld. Parenterally administered multivitamins were given daily. The patient called for Demerol by name two hours after the hypodermic injection of 100 mg. of the drug. The pulse rate rose to 145 and remained rapid in remittent fashion. Pain, sleeplessness and vomiting dominated the picture and food was largely refused. Reddish brown urine, which darkened still more on exposure to light, was voided.

From the Medical Service at Meadowbrook Hospital, Hempstead, N. Y.

At times the patient appeared confused and out of touch with reality.

A laboratory to which a 24-hour urine specimen of 770 cc. had been sent reported a porphyrin content of over 500 micrograms (normal: 60 to 125 micrograms).

Demerol was discontinued. Intravenous calcium gluconate produced a very unpleasant subjective reaction. An alkaline ash diet with bicarbonate of soda only lightened the color of the urine. Cobra venom in daily doses of 1 cc. produced no measurable results. On the ninth day 1.05 gm. of procaine was added to an infusion of 5 per cent glucose and saline and administered intravenously at a rate of 20 drops per minute. After 400 cc. had been given the patient experienced pronounced remission of symptoms, the only residual complaint being excessive irritability. The following day she felt still better, ate all the food brought to her and was out of bed in a wheel chair for the first time in eight weeks. She stayed well for six days, gained 2 pounds, and then all the symptoms recurred. Procaine, 0.1 per cent in glucose in saline was infused intravenously, and after 400 cc. the patient felt completely comfortable and the infusion was stopped. A high caloric diet was substituted for the alkaline ash diet. Cobra venom was continued in 1 cc. doses three times per week. Six days later, following the extraction of an abscessed tooth, the symptoms returned, with darkening of the urine. These symptoms cleared in 20 hours without additional treatment. The patient then remained symptom-free for four weeks and was discharged. At this time the deep reflexes had returned in the lower extremities and sensation appeared to be normal.

Three and one-half months later the patient was readmitted with complaint of cramping pains in the lower back and abdomen one week in duration. She had felt well since discharge from the hospital, had engaged in normal domestic and social activities and had had only occasional nocturnal cramping pains in the thighs. Cobra venom three times a week ameliorated this distress to a considerable extent. She had stayed up night and day with her children, who had been ill for the week prior to the second admission, and it was during this time that the symptoms returned with a noticeable darkening of the urine. Daily doses of cobra venom had given no relief.

Except for some diminution in deep reflex responses there was no pronounced change noted on physical examination from the patient's condition at the time of the previous discharge. She received an infusion of 5 per cent glucose and saline which she thought contained procaine. Failing to receive the anticipated relief she became extremely anxious and despondent and was given chloral hydrate and sodium bromide, 0.65 gm. of each, at bedtime. After this was presumably vomited, 2½ ounces of paraldehyde was given per rectum, and the next morning the patient was in coma and shock. The standard treatment for shock was given, together with amphetamine sulfate intravenously, and in 12 hours shock had been overcome. The patient was confused and hallucinary for the ensuing 12 hours but still complained of pain. Two generalized convulsions were observed, one following a lumbar puncture by two hours. On the seventh hospital day the patient complained of blurred vision and then of being able to see only a portion of an object at a time. An ophthalmological consultant's opinion was that she had bilateral scotomata secondary to a lesion central to the geniculate bodies and involving the optic radiations. The patient was unable to urinate at this time and catheterization was necessary. Abdominal and back pains continued. The convulsions, scotomata and urinary retention were reported by members of the family as having occurred in previous attacks. The blood pressure at this time was 160 mm. of mercury systolic and 125 mm. diastolic. Procaine in glucose and saline, 0.1 per cent, had to be given on three separate occasions, the last time for a recurrence of pain with another abscessed tooth. These infusions were given two days apart, the relief being complete for 24 hours each time. Succeeding attacks after each infusion were less severe. By the 11th hospital day the patient was asymptomatic, vision appeared normal and the blood pressure was 120 mm. of mercury systolic and 80 diastolic. During this time the body weight had decreased from 108 to 100 pounds.

LABORATORY DATA

There was considerable laboratory work done and only a few of the results will be mentioned. Porphyrobilinogen was found in the urine during the first admission and not during the second, possibly the result of the patient having received large amounts of bicarbonate of soda latterly. Leukocytosis fluctuated, rising to as high as 19,000 cells with 83 per cent polymorphonuclears. Hemoglobin stayed in normal range. Urea nitrogen rose to 40 mg. per 100 cc. on one occasion but usually was normal. Creatinine rose once to 3.1 mg. per 100 cc. Blood proteins were within normal range and ratio. Blood sugar and chlorides remained normal. Except for one rise to 450 mg. per 100 cc. and 150 mg. per 100 cc., respectively, the total cholesterol and esters were normal. The icteric index varied between 6 and 12 units. Results of cephalin-cholesterol flocculation changed from 4 plus to 3 plus to 2 plus as the patient's condition improved. The erythrocyte sedimentation rate (Cutler) stayed within normal range. The Rumpel-Leede test was not abnormal. One blood calcium determination was reported as 13.2 mg. per 100 cc., but the determination was not repeated, the blood alkaline phosphatase being 10 King-Armstrong units. Specific gravity of the urine ranged up to 1.035 and urobilinogen was increased on two occasions. Phenolsulfonephthalein excretion was 90 per cent in two hours. Pyelography disclosed no abnormality. The basal metabolic rate was minus 4. Results of gastric analysis were normal. Gastrointestinal and gallbladder roentgen studies were reported as showing no abnormality, although multiple areas of calcification were reported throughout the abdomen. Electrocardiograms in February and June of 1947 exhibited moderate Q waves in L2, L3, and in the AVF leads. The QL2 and QL3 had not been present a year before and were associated with an isoelectric T2 and T3. The spinal fluid was normal.

Following discharge from the hospital the patient remained well for nine months except for occasional mild discomfort in abdomen and thighs with infrequent headaches and back pain. At the end of that time, another exacerbation occurred and the patient was hospitalized after six weeks of symptomatic treatment. Six infusions of 0.1 per cent procaine were given over a period of 12 hospital days and the acute episode ended. The blood pressure fell promptly from 155 mm. of mercury systolic and 100 mm. diastolic to 120 mm. systolic and 80 mm. diastolic, and the patient was discharged symptom-free.

DISCUSSION

Acute porphyria is a disease of undetermined cause, running a chronic course with recurrent acute exacerbations which express themselves through abdominal, cerebral and neurological symptoms. Frequently the urine is red to dark brown and tends to darken further upon exposure to light. The mortality rate is reported as varying from 50 per cent to 90 per cent, with approximately 80 per cent of patients dying within five years from the first appearance of neurological symptoms.[8] Women are more commonly affected than men and there is a tendency to multiple familial incidence. Onset is most commonly in the second and third decades of life. No consistently effective treatment has as yet been evolved, although temporary symptomatic relief has been achieved (inconstantly) by a variety of methods and agents.

Halpern and Copsey,[3] in a comprehensive paper, recorded the varied symptomatology of the disease and the observed objective findings. The nervous, gastrointestinal and cardiovascular systems are most frequently involved and there is a tendency for objective as well as subjective findings to disappear as the acute attack subsides. Characteristics of cardiovascular involvement described are tachycardia, transient changes in electrocardiograms, and transient hypertension. Halpern and Copsey also reported three cases in which there was necrosis of renal arterioles, as well as one case of periarteritis nodosa. Attenuation of the retinal arteries occurring during attacks (associated with hypertension in some cases) has been observed.[8] Involvement of the nervous system has been manifested by convulsions, peripheral neuritis, flaccid paralysis, amblyopias, scotomata, cranial nerve changes, respiratory paralysis and the demonstration, occasionally, of the reaction of degeneration. In addition, apathy, catatonia, sleep disturbances, delirium, psychoses and headaches have been observed to occur. Gastrointestinal tract involvement is manifested chiefly by nausea, vomiting, abdominal pain, distention, constipation, and ileus; even diarrhea and jaundice have been reported. X-ray studies during attacks reveal generalized or localized constriction or dilatation of practically any portion of the gastrointestinal tract. Fever and polymorphonuclear leukocytosis are the common systemic responses during acute attacks.

It appears probable that angiospasm could be responsible for at least a portion of the findings relative to the cardiovascular and nervous systems. Petechial hemorrhages, focal necrosis and widespread degeneration in the central nervous system have been described.[1, 5] Restriction of the blood supply conceivably could induce changes in the motor activity of the gastrointestinal tract such as to produce clinical symptoms. Blood vessel spasm might also serve as an explanation of the infrequent observations of hematemesis and melena[8] during the acute episodes of this disease; or, spasm of smooth muscles involving the intestinal tract directly could give rise to the gastrointestinal picture. Mason and coworkers[5] and Nesbitt[6] attributed findings to lesions in the autonomic nervous system. Dobriner and Rhoads[2] considered the muscular action of porphyrin as capable of producing the disease picture, possibly through different mechanisms since the action on the gastrointestinal tract could be inhibited by neostigmine and the capillary effect by mecholyl. Although the ability to produce spasm of smooth muscle by porphyrin compounds is well recognized,[2, 7] clinically, a severe attack may be accompanied by a relatively low porphyrin excretion, and conversely, a severe attack may abate with continued fairly high excretion of porphyrin.[3] Increased porphyrin excretion appears to be a concomitant phenomenon of this disease complex and its role as an initiating factor of the acute clinical attacks is yet to be clearly proved.

According to Hazard[4] the effect of intravenous procaine therapy in man is the aggregate of analgesic, sympatholytic and vasodilating actions and, secondarily, of parasympathetic and anti-contracting action. In the case herein described the dramatic improvement and the duration of remission following the administration of procaine intravenously during three distinct acute clinical exacerbations of the disease suggest that the action of the procaine was something more than simple analgesia.

SUMMARY

A classical case of acute porphyria is described. Clinical and laboratory findings were characteristic of this disease complex. The patient improved dramatically with intravenous administration of procaine during three separate exacerbations.

The site of action of the procaine was not ascertained, but it is felt that its sympatholytic, anti-contracting and secondarily parasympathetic effects were responsible for breaking down a pathologic reflex state which appears to distinguish the acute attacks.

1061 Second Street.

REFERENCES

1. Abbott, K. H., and Evans, H. S.: Bull. Los Angeles Neurol. Soc., 2:20, June 1946.

2. Dobriner, K., and Rhoads, C. P.: The porphyrins in health and disease, Physiol. Rev., 20:416, July 1940.

3. Halpern, R. M., and Copsey, H. G.: Acute idiopathic porphyria, Med. Cl. N. Am., March 1946.

4. Hazard, R.: Present status of the physiologic actions of novocaine and its therapeutic applications, Progress Med., 73:403, Dec. 10, 1945.

5. Mason, V. R., Courville, C. B., and Ziskind, E.: The porphyrins in human disease, Medicine, 12:355, Dec. 1933.

6. Nesbitt, S.: Acute porphyria, J.A.M.A., 124:286, Jan. 29, 1944.

7. Rask, E. N., and Howell, W. N.: Photodynamic action of hematoporphyrin, Am. J. Physiol., 84:363, March 1928.

8. Watson, C. J.: A Textbook of Medicine, 7th ed., Cecil, R. L., W. B. Saunders Co., 1947.

Bile Peritonitis Due to Spontaneous Rupture of a Dilated Intrahepatic Duct

Report of a Case

Dudley J. Fournier, M.D., *Los Angeles*

THERE are several generally recognized ways in which bile may enter the peritoneal cavity. The more common causes of choleperitoneum are rupture of the wall of the gallbladder or extrahepatic ducts from obvious necrosis, leakage of bile following cholecystectomy, and effusion from the bile ducts in the absence of demonstrable perforation. In the case of neglected cholecystitis herewith reported, autopsy revealed an unusual location of perforation of the biliary tract. A dilated intrahepatic duct on the anterior surface of the liver ruptured spontaneously, resulting in bile peritonitis.

CASE REPORT

A white housewife, aged 66, entered the hospital on March 7, 1949, complaining of severe intermittent pain of 24 hours' duration in the right upper quadrant of the abdomen. The pain was intense, radiated to the back, right shoulder, and epigastrium, and was accompanied by frequent vomiting of white mucoid material. Two days before admission the patient had had frequency and urgency of urination and had passed several loose greenish-black stools. There was no previous history of stools or urine of unusual color. There were no chills, fever, or jaundice. The patient stated that her weight had been static and her appetite fair except for an intolerance to cabbage, beans, and fatty foods. She complained of passing considerable flatus. There had been many similar attacks, three necessitating hospitalization. In each instance the patient had been told that she had disease of the gallbladder and operation had been recommended but she refused. Cholecystography showed the gallbladder was not functioning. Previous operations included cesarean section, tonsillectomy, and four uterine curettements.

The blood pressure was 140 mm. of mercury systolic and 110 mm. diastolic, and the pulse rate was 84. The temperature was 100.4° F. Extreme tenderness of the abdomen in the right upper quadrant and epigastrium was noted, and

---

Resident in General Surgery, Queen of Angels Hospital, Los Angeles.

there was moderate rigidity with rebound tenderness. No masses were palpable and no bowel sounds could be heard.

Results of examination of the blood and urine were within normal limits. The amylase value of the plasma was 76 units. A roentgenogram of the abdomen revealed no abnormalities and there were no opaque biliary or renal calculi.

The patient was given penicillin and general supportive therapy. The next day the condition had become much worse, and a surgical consultant advised operation. This was refused by the patient. On March 9 severe shock occurred. Some improvement followed transfusions of whole blood, but oliguria developed. Only 25 cc. of very dark urine was passed during the day. On March 10 only 8 cc. of urine was excreted, and slight jaundice was noted. The patient was semicomatose throughout the day and she died soon after midnight.

The significant autopsy findings pertaining to the liver and gallbladder were as follows: The peritoneal cavity contained approximately 800 cc. of cloudy, yellow, foul-smelling fluid. There were no adhesions. The gallbladder was greatly dilated and tense. There was pronounced dilatation of the cystic, hepatic and common ducts, the latter measuring 2 cm. in diameter. The gallbladder and all extrahepatic bile ducts were filled with numerous faceted gallstones. One calculus, 2 mm. in diameter, was lodged in the ampulla of Vater and completely occluded it. The mucosa of the gallbladder and bile ducts was intact and showed no evidence of perforation. A thick, bile-stained, fibrinous exudate covered the anterolateral surface of the right lobe of the liver and extended over the anterior surface of the gallbladder. The undersurfaces of this lobe and the gallbladder were entirely free of exudate, as was the rest of the liver to the left of the falciform ligament. In one area the exudate seemed somewhat thicker than elsewhere. In a section cut through the area, there appeared to be a greatly dilated intrahepatic duct lying just beneath the surface. It was 6 mm. in diameter, and the distal end was covered only with the fibrinous exudate noted on the surface of the liver. All intrahepatic ducts were greatly dilated and were filled with cloudy green bile.

Two sections of liver were studied. These were taken to include the dilated intrahepatic bile duct noted near the anterior surface. Along the lining surface of this space there was a thick layer of fibrous, partly hyalinized connective tissue. There was no epithelium lining the space. The liver tissue surrounding the cystic space showed varying degrees of degenerative change. The liver sinusoids were dilated and many were filled with blood. The bile capillaries were moderately dilated and a few contained inspissated bile.

2301 Bellevue Avenue.

* * *

California
MEDICINE

OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8 PHONE DOUGLAS 2-0062

Editor, Dwight L. Wilbur, M.D. *Assistant to the Editor*, Robert F. Edwards
Editorial Executive Committee
Albert J. Scholl, M.D., Los Angeles H. J. Templeton, M.D., Oakland
Edgar Wayburn, M.D., San Francisco
For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIALS

Public Health Progress

The steady improvement in the health of the American people during the last 50 years has been the result of many forces, economic, educational and environmental. Amongst the more important of the economic and the educational factors has been improved medical care, both preventive and therapeutic, and amongst the more important of the environmental factors has been improved public health service.

There are now many different public health activities and it is difficult or impossible for any one physician to keep in touch with all of them. There are so many voluntary public agencies interested in health education and welfare that the average citizen is bewildered. At least 20 national foundations or organizations are now devoted to the amelioration of certain diseases or groups of diseases.

In order to integrate information on the activities of various public health and public welfare groups, and in order to assist such groups with sound guidance in the medical aspects of these various endeavors, the Council of the California Medical Association by unanimous vote in November 1949 created a *Public Health and Public Agencies Committee.* The purposes of this committee are to keep in touch with local, state and federal health departments and health officers, and to carry out the stated policies of the organized medical profession with respect to functions of these agencies (see page 249 for the official resolution).

In order that this committee may function in as efficient a manner as possible, it has been directed to coordinate the activities of existing committees on:

(a) Liaison with local health officers.
(b) Hospital construction.
(c) Chronic diseases.

From time to time additional sub-committees on allied matters will be added and it is the intention of the Council that these various groups shall function in a coordinate fashion. In order to aid their functioning it is essential that every member of the Association keep himself informed on the activities of local public health officers and welfare agencies, and assist these groups in a manner consistent with policy laid down by the profession at large.

There have already been some meetings of the existing sub-committees with appropriate vis-a-vis groups. For example, the Liaison Committee with Local Health Officers has met with representative county health officers and completed preliminary definitions of a *health center* and of the reasonable functions of a local health department. The Committee on Hospital Construction has met with representatives of the State Commission on Hospitals and attempted to guide the new bed program along the most needed lines. The Committee on Chronic Diseases has met with similar committees of the State Department of Health, the American Cancer Society and allied agencies in an attempt to evolve practical methods of improving sickness service to persons with chronic diseases.

It is not improbable that the future will see additional special commissions organized within the

California Medical Association devoted to certain of the more common chronic diseases and created on a pattern similar to that of the Cancer Commission. With strong medical leadership and guidance the program of various voluntary welfare agencies and tax-supported public health agencies will achieve greater usefulness for the public welfare.

Know Thyself

Expansion and improvement of voluntary health insurance plans reduce the threat of socialized medicine. Expansion to the point where a large percentage of the population is covered by some form of prepaid health protection will make cogent argument against those who propose government medicine as a "necessity." Continued improvement of voluntary plans will make a bureaucratic system unattractive to more and more of those who would be affected by it.

One of the most important steps we can take in expansion and improvement of voluntary plans is to make our own California Physicians' Service as successful as it can possibly be. We are better able to do this as we become better informed about C.P.S. Greater understanding and knowledge of the various aspects of C.P.S. relating to the physician's office and his practice are certain to be reflected in smoother functioning of the entire C.P.S. operation.

Therefore, to contribute to the increased success of C.P.S. through a better informed physician-membership, CALIFORNIA MEDICINE this month inaugurates a regular section devoted to questions and answers about C.P.S. The first installment of this new feature will be found on page 252.

Letters to the Editor . . .

Dietary Proteins vs. Tuberculosis

European vital statistics[2, 3, 6] suggest that a liberal protein diet has a protective value against tuberculosis. Koerner[4] and his associates of the University of Pennsylvania confirmed this conclusion by inoculation experiments on animals maintained on diets of different protein content.

They had available for such tests three colonies of white rats which had been maintained for several generations on diets containing respectively 15, 25 and 40 per cent protein. Each animal was inoculated intravenously with a standard dose of virulent tubercle bacilli of the bovine type. Characteristic differences in subsequent growth rates were noted. Animals fed 15 per cent protein increased from an average weight of 190 gm. at the time of inoculation to 280 gm. by the 90th day, after which the average weight fell to 220 gm. by the 150th day. Animals fed 40 per cent protein increased to 300 gm. by the 84th day and maintained this weight till the end of the experiment.

Animals fed 40 per cent protein outlived by several months those on the two lower protein diets. The incidence of terminal pneumonia was very high in the 15 per cent group and much less with the 40 per cent animals. (This pneumonia is frequent in rat colonies, and is etiologically variable.[5]) Necropsia of animals on the 15 and 25 per cent diets showed tubercle bacilli present in enormous numbers in the tissues. In the tissues of the 40 per cent group the number of tubercle bacilli was much less. Decreases in the size and extent of the tuberculous lesions were noted in the 40 per cent animals after the 150th day. Such decreases did not occur in the 15 and 25 per cent groups.

It was shown by Cannon[1] that specific antibodies are synthesized largely from dietary proteins. A high level of protein intake would thus favor the development of specific humoral defenses. Whether or not increase in specific antibody formation would fully account for the observed increased resistance to tuberculosis has not been determined.

REFERENCES

1. Cannon, P. R.: Some pathologic consequences of protein and amino acid deficiencies, C. C. Thomas, Springfield, Ill., 1948.
2. Faber, K.: Acta Tuberc. Scandinav., 12:287, 1938.
3. Kirschner, M.: Z. F. Tuberk., 34:228, 1921.
4. Koerner, T. A., Getz, H. R., and Long, E. R.: Proc. Soc. Exp. Biol. and Med., 71:154, May 1949.
5. Ratcliffe, H. L.: The Rat in Laboratory Investigation, Chapter 22, Lippincott Co., Philadelphia, 1942.
6. Schröder, G.: Beitr. z. Klin. d. Tuberk., 75;61, 1930.

W. H. MANWARING, M.D.
Stanford University, Calif.

CALIFORNIA MEDICAL ASSOCIATION

R. STANLEY KNEESHAW, M.D. President
DONALD CASS, M.D. President-Elect
LEWIS A. ALESEN, M.D. Speaker
DONALD A. CHARNOCK, M.D. Vice-Speaker
SIDNEY J. SHIPMAN, M.D. Council Chairman
L. HENRY GARLAND, M.D. Secretary-Treasurer
H. GORDON MacLEAN, M.D. Chairman, Executive Committee
DWIGHT L. WILBUR, M.D. Editor
JOHN HUNTON, Executive Secretary General Office, 450 Sutter Street, San Francisco 8
ED CLANCY, Field Secretary Southern California Office, 417 South Hill Street, Los Angeles 13. Phone: MAdison 8863

NOTICES AND REPORTS

A New Unit of the California Medical Association—

THE PUBLIC HEALTH AND PUBLIC AGENCIES COMMITTEE

The Public Health and Public Agencies Committee was created by unanimous vote of the Council at its regular meeting in San Francisco on Sunday, November 20, 1949.

PURPOSES AND SCOPE

To keep in constant touch with local, state and federal health departments and health officers, and to carry out the stated policies of the California Medical Association with respect to all functions of these health agencies, specifically including hospital construction financing, state aid to local health departments, crippled children's services, chronic disease activities and services, rheumatic heart disease financial aid, health center activities, and all other statutory functions of local, state or federal health agencies in California; to keep in constant touch with and to carry out the policies of the California Medical Association with respect to all medical activities and programs of other federal, state and local agencies, including the State Department of Education, State Department of Social Welfare, State Department of Employment, Vocational Rehabilitation Service, governmental care of the indigent, federal medical care to veterans, and all other federal, state or local government agencies in California that undertake activities relating to medical care.

GENERAL POLICY

In carrying out its functions, the committee shall constantly bear in mind that the California Medical Association approves and supports effective and efficient public health services in the field of public health (hygiene, sanitation, quarantine and other measures to prevent communicable diseases, vital statistics, pure food and drug enforcement, water supplies, abatement of public nuisances, etc.), but opposes the extension of public health services into the field of diagnosis or treatment of individuals who are not, through lack of resources, properly wards of the government, on the ground that it is contrary to the public interest to socialize medical care in California through step-by-step extension of public health activities.

COMPOSITION

The Council's permanent Committee on Public Health and Public Agencies shall consist of three members of the Council, plus the Chairman of the Council and the Secretary ex officio, with the right to vote. The committee shall select its own chairman and shall have the power to delegate the various phases of its duties to sub-committees appointed by it. The membership of sub-committees may include any member of the Association.

SUB-COMMITTEES

The Council directed that the existing committees on:

(a) Liaison with Conference of Local Health Officers,

(b) Hospital Construction, and

(c) Chronic Diseases

be continued as sub-committees until the next Annual Session. It is the recommendation of the Council that these sub-committees should continue to function, but in closer cooperation with each other and with the parent committee. The Council appointed the following members of the Committee on Public Health and Public Agencies: L. A. Alesen, chairman, C. V. Thompson, F. E. West, the Council Chairman and the Secretary.

The following are the members of the other committees:

Liaison with Local Health Officers: Doctors Shipman, Wilbur, Alesen and Askey.

Hospital Construction: Doctors Thompson and Anderson and Mr. Hassard.

Chronic Diseases: Doctors Bruck, Graeser and Howson.

Executive Committee Minutes

Tentative Draft: Minutes of the 219th Meeting of the Executive Committee, San Francisco, February 16, 1950.

The meeting was called to order by Chairman MacLean at 2:00 p.m. in Room 212 of the St. Francis Hotel, San Francisco, on Thursday, February 16, 1950.

Roll Call:

Present were President-Elect Cass, Speaker Alesen, Council Chairman Shipman, Auditing Committee Chairman MacLean and Secretary Garland. Present by invitation were Executive Secretary Hunton, Assistant Executive Secretary Wheeler and Legal Counsel Hassard. A quorum present and acting.

1. *Legislative Service:*

On motion duly made and seconded, it was voted to continue a subscription of $500 annually to a reporting and information service in Washington, D. C.

2. *Vocational Rehabilitation:*

Discussion was held on the manner in which examinations and diagnostic procedures are undertaken under the program of the Bureau of Vocational Rehabilitation of the State Department of Education. It was pointed out that some procedural changes had been made to provide a limit to the amount of diagnostic procedures to be undertaken prior to application of a means test and it was agreed that representatives of the bureau be invited to address the next meeting of the Council.

3. *Hospital Construction:*

Discussion was held on the wording of the Statement on Hospital Construction approved by the Council at its meeting of January 14, 1950, and it was agreed that copies of this statement to be distributed in the future be amended so that in Paragraph 8 the words "immediately opens" be deleted and the words "tends to open" be substituted therefor.

4. *Health Councils:*

A proposal by Dr. Carroll B. Andrews, chairman of the Committee on Rural Health, for the establishment of local health councils was discussed. It was agreed to ask Dr. Andrews to prepare an outline of procedure for discussion at the next Council meeting and to enlist the services of the Woman's Auxiliary in inaugurating this program throughout the state.

5. *Auditor for C.M.A.:*

The selection of an auditor to examine the books of the Association was discussed and it was regularly moved, seconded and voted to defer such selection for further discussion at the discretion of the chairman.

6. *C.P.S. Fee Schedule Committee:*

Dr. Shipman, Council Chairman, announced the receipt of the resignation of Dr. William L. Bender from the C.P.S. Fee Schedule Committee because of the weight of other duties. It was regularly moved, seconded and voted to accept this resignation with regret and to approve the appointments of Dr. Harold M. F. Behneman as chairman and Dr. William C. Mumler as a member of this committee.

7. *Industrial Medical Fees:*

After discussion, it was regularly moved, seconded and voted to request the Council Chairman to add geographical representation to the Advisory Committee to the Negotiating Committee on Industrial Medical Practice. It was also agreed to arrange for a meeting of the Negotiating Committee and all interested parties at noon on April 30, opening day of the 1950 Annual Session in San Diego.

8. *Employee Annuities:*

The proposal of an insurance underwriter for the issuance of additional insurance on the lives of the Association employees was discussed and it was regularly moved, seconded and voted to advise him that no action is contemplated at this time.

9. *Los Angeles Anatomical Institute:*

The request of the Los Angeles Anatomical Institute for approval by the Association was discussed and it was agreed to give further consideration to this request.

10. *New Mexico Physicians' Service:*

Mr. Hunton reported on his visit to New Mexico, where he attended a meeting of the board of directors of New Mexico Physicians' Service and officials of Business Men's Assurance Co., the insurance carrier with which the physicians of New Mexico are now working to provide a prepayment medical care service. The present financial outlook appears to provide about a 40 per cent to 50 per cent repayment to the C.M.A. of funds owed by N.M.P.S. and it is possible that an extension of the working agreement with Business Men's Assurance Co. and with other insurance carriers may produce enough revenue to allow full payment of the funds loaned.

11. *Public Relations:*

It was regularly moved, seconded and voted to approve the support of a speaking tour of Mr. Cecil Palmer and to allow for necessary travel expenses of Drs. M. Laurence Montgomery and Richard O. Bullis, co-representatives of the national education campaign, the total of these items to come to not more than $1,000.

12. *Committee on Chronic Diseases:*

It was regularly moved, seconded and voted to appoint Dr. Robertson Ward of San Francisco as co-chairman of the Committee on Chronic Diseases (E. L. Bruck, chairman; Carl Howson and James E. Graeser, members).

Adjournment.

Resolution on Voluntary Welfare Agencies

Adopted by the Council of the California Medical Association, November 20, 1949

Whereas, Numerous organizations devoted to the control of certain serious diseases are now in existence and others devoted to related purposes are in process of development, all tending to duplicate the work of existing public and semi-public agencies, and

Whereas, The programs of these groups frequently require the performance of free medical services, which physicians are happy to contribute so long as the programs are fundamentally sound, and

Whereas, There has grown up some duplication of effort in these programs which detracts from their medical and economic soundness, and

Whereas, Some of these programs already significantly influence the practice of medicine and may, if unchecked, lead to the socialization of the profession; now, therefore, be it

RESOLVED: That the California Medical Association on and after July 1, 1950, shall require review by the Council of all programs of the above type which are conducted in this state and which depend on the services of the medical profession for their successful operation, said review to be obtained within six months of the effective date of this resolution.

POLICIES RECOMMENDED BY CALIFORNIA MEDICAL ASSOCIATION FOR VOLUNTARY WELFARE AGENCIES

1. There should be an adequate number of physicians on the Governing Board of the Agency in order to render sound medical guidance. There should be a segregation of functions of the Board, and that portion of the Board or sub-committee of the Board dealing with medical problems should have at least 50 per cent of its members chosen from practicing physicians licensed in the territory or state in which the agency functions or proposes to function. Participation by members of allied professions should be encouraged (dentists, nurses, public health workers, veterinarians, etc.).

2. The program should be designed so as *not to duplicate existing approved* welfare programs of the type contemplated. In this connection, established medical welfare agencies whose objectives duplicate each other should be encouraged to consolidate their work into one agency.

3. Education concerning disease, its prevention, early diagnosis and treatment should be the basic objective of such programs. An informed public tends to be an educated and discriminating public. *The basic objective of the program should be adequate education* in the public schools, and various adult associations in regard to the disease in question, its prevention, early diagnosis and care.

4. The group should not embark upon diagnostic or therapeutic ventures amongst those sections of the public not classified as needy or indigent, with the exception of communicable disease programs. The policy of the group should be that measures leading to the *further socialization of medicine be avoided.*

5. The overhead and number of paid employees of the group, professional or lay, shall be kept to a minimum consistent with efficient operation of the program. Financial details concerning the operation of such programs should be readily available to interested persons.

In Memoriam

Armstrong, Eugene Lawson. Died in Los Angeles, January 25, 1950, aged 53, of cerebral hemorrhage. Graduate of Tulane University of Louisiana School of Medicine, New Orleans, 1920. Licensed in California in 1922. Dr. Armstrong was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Kane, Louis Matthew. Died in Los Angeles, February 8, 1950, aged 65, of a heart ailment. Graduate of Northwestern University Medical School, Chicago, 1912. Licensed in California in 1914. Dr. Kane was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Reeves, James Walter. Died in Los Angeles, January 28, 1950, aged 64. Graduate of the College of Physicians and Surgeons, Los Angeles, 1913. Licensed in California in 1913. Dr. Reeves was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Shryock, Alfred Quimby. Died in Loma Linda, January 3, 1950, aged 78, of cerebral thrombosis. Graduate of the American Medical Missionary College, Battle Creek, 1899. Licensed in California in 1911. Dr. Shryock was a retired member of the San Bernardino County Medical Society, and the California Medical Association.

◆

Sumerlin, Harold Stanley. Died in Los Angeles, January 31, 1950, aged 58. Graduate of the Indiana University School of Medicine, Bloomington-Indianapolis, 1917. Licensed in California in 1924. Dr. Sumerlin was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Uhls, Russell Todd. Died in Los Angeles, January 31, 1950, aged 61. Graduate of the University Medical College of Kansas City, 1911. Licensed in California in 1925. Dr. Uhls was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

• Questions and Answers about C. P. S. •

(*Editor's Note:* CALIFORNIA MEDICINE this month inaugurates a Question-and-Answer Page about C.P.S. The questions and answers are intended to serve as a background for the many new physician-members of C.P.S., as well as a worthwhile review of information for other physician-members and their staffs. In future issues, this page will appear as a regular feature.

The purpose of this series is to provide an additional means, supplementing other mediums already being used, of bringing information regarding C.P.S. to its physician-members. Printed in CALIFORNIA MEDICINE, it will become a permanent file to which C.P.S. physician-members may refer for guidance on specific matters relating to C.P.S., their own voluntary health plan. C.P.S. physician-members are invited to submit questions to the Editor. Every effort will be made to print answers to all questions which can be answered within our space limitations.)

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Question: How rapid has been the growth of C.P.S. since its founding?

Answer: As is well known, C.P.S. was founded in February 1939 and was a definite pioneer in the field of voluntary prepaid health care by the medical profession inasmuch as it was the first such health plan in the United States to operate on a statewide basis. Its growth since that time has been notable, both in numbers and as a reflection of the wisdom of those leaders of the medical profession in California who were prominent in the organization of C.P.S.

Embarked in an uncharted field, C.P.S. did not have a rapid growth in its early years. Instead, it expanded slowly, gradually accumulating the vital actuarial experience which was essential to a solid foundation for the future. Another factor which contributed toward a modest early expansion was the co-existence of World War II when the nation's energies and attention were concentrated on the war effort.

In 1940, at the end of its first year, C.P.S. had 20,000 beneficiary members, and this figure increased modestly year by year until the 100,000 mark was surpassed in 1945. Then, with the war at an end and the public returning to peacetime pursuits, membership began the rapid rise which has been prevalent in postwar years. Two years later, in 1947, there were more than 400,000 beneficiaries; by 1949, the total was 700,000; and by 1950, the eleventh anniversary of C.P.S., the figure was approximately 900,000.

The increase in C.P.S. physician-membership has closely paralleled the growth of beneficiary-membership. From an original 5,000 in 1939, the number gradually rose to 5,400 by 1945; then, with the return of many doctors from the armed forces, a sharp increase occurred. In 1947 there were 8,000 physician-members; in 1949, 9,500 and now there are 10,300.

Question: As a doctor, how can I best determine the type of coverage held by a C.P.S. patient?

Answer: The best, and the quickest, method of determining the type of coverage held by a C.P.S. member is by reference to the Membership Card. Every C.P.S. member is issued a card which clearly indicates the type of coverage. Because members of the same family do not always have the same coverage, it is important to refer to the card of *the person being treated*. For example, a father's card should not be used to determine the C.P.S. coverage of his children.

(Persons who have the new "catastrophic coverage" will have an additional card, pink in color, and with any waived ailments listed.)

Question: My secretary handles all clerical details in regard to my C.P.S. patients. How can I assure myself that she is thoroughly informed on C.P.S. billing and related matters so that, in my office, C.P.S. functions smoothly, for me and my patients?

Answer: C.P.S. maintains a staff of trained personnel to provide instruction and information to physician-members and their office employees regarding all aspects of C.P.S. (In Northern California, this department is called Professional Relations; in Southern California, it is called Physicians' Relations; the work of each is the same.)

Created to serve as a liaison between C.P.S. and physician-members and their office assistants, the department's personnel endeavor to contact every physician-member's office, personally or by telephone—or by instruction meetings for groups of medical secretaries when feasible. Over and above this routine activity, the department is available for individual instruction upon request to either the San Francisco or Los Angeles office.

In addition to the services of the Professional (or Physicians') Relations Department, there are several other ways for medical secretaries to learn the answers to specific questions about C.P.S. and to keep abreast of changes. These include: Careful reading and filing of all letters of instruction issued by C.P.S.; reference to "general instructions" in the front part of the Fee Schedule; reading and filing of *Progress* (the C.P.S. quarterly publication), especially the inside section devoted to medical secretaries; reference to "Methods and Procedures" of the Home Town Care Program when dealing with veteran patients.

Question: **If the combined husband and wife income is more than $3,600—but the income of the employee member is under $3,600—how does the C.P.S. income ceiling apply?**

Answer: In this case the patient is over the income ceiling because the $3,600 clause clearly denotes the gross *family* income. The C.P.S. definition of annual gross family income is: "Total income from all sources for the employee, spouse (husband or wife) and dependent children for the last previous calendar year, less business expenses, if any, which are ordinarily allowable for income tax purposes."

C. P. S. Finances

The financial position of the California Physicians' Service is showing steady improvement which we hope will continue. The financial policy of the board of trustees has been to:

1. Increase dues whenever experience showed that any part of our contract was not carrying its way.

2. Expand the coverage offered by C.P.S. to anticipate public demand as fast as we thought we could assume the risks of this new experimental coverage.

3. Correct inequities in the fee schedule and bring the payments to the physicians up to the full unit value as soon as possible.

We have felt that roughly half of the improvement in C.P.S.' financial position should be used for these purposes, the other half to be retained in the contingent fund.

California Physicians' Service is now 11 years old. It started out with a small advance from the California Medical Association and the agreement of the physician members to perform the services required of them under the C.P.S. contracts whether they were paid or not. In the early years of experimentation, and while actuarial data were being developed the hard way, public confidence in C.P.S. contracts rested on this agreement of the doctors to perform.

C.P.S. now disburses to physicians and hospitals at the rate of about $20,000,000 a year, roughly $15,000,000 of this amount being paid to physician members. It is not fair to ask individual physicians to assume personal liability for this kind of money, nor can we ask employers of large groups who are C.P.S. beneficiary members to pay in this $20,000,000 or encourage their employees to do so on the strength of the original agreement of the doctors to perform under the contracts.

This means that C.P.S. must now, as a mature organization, accumulate enough financial responsibility so that the doctors can be proud of their organization and feel financially secure in their membership in it. The beneficiary members must feel that their financial interests are as safe as they would be in an insurance company. Those who might have any interest in destroying the organization for political reasons must know that C.P.S. makes sense, that it is not just a political plaything of the doctors, and that being on a sound financial basis itself, its figures can be relied on for actuarial data on the cost of medical care.

C.P.S. has not reached that goal yet, and the trustees believe, after considerable investigation and study of the subject, that C.P.S. should have financial responsibility, represented by surplus cash and Government bonds, amounting to at least $2.50 per beneficiary member. We now have about $1.40. During the past year about 35 cents per member has been added to that fund. This was two cents on the dollar of payments to the physicians. We hope that during the coming year our experience will be favorable enough to add another 50 cents to the fund and at the same time make some improvement in the fee schedule.

Ransom M. Cook, *Treasurer*
Board of Trustees

March 6, 1950.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. Stanley R. Truman of Oakland was installed as president of the American Academy of General Practice at the meeting of that organization in St. Louis in February.

* * *

A grant of $5,000 to Stanford University School of Medicine, to be used in support of **research on tuberculosis** being conducted jointly by the medical school and Arroyo del Valle Sanatorium at Livermore, was awarded recently by the Alameda County Tuberculosis and Health Association. The research project is under the direction of Dr. Sidney Raffel of the department of bacteriology and experimental pathology at Stanford, and Dr. E. Gwyn Roberts of the sanatorium.

FRESNO-MADERA

Organization of a number of Fresno and Madera county physicians into a group which plans to become a chapter of the **American Academy of General Practice** was announced recently by Dr. Elmer Hof of Fresno, president of the new group. Other officers of the organization are Dr. Milton Schatz, secretary, and Dr. Thomas A. Collins, treasurer.

Next step is for the local group to petition for membership in the California division of the Academy which now is reported to have some 1,400 members in the state.

MARIN

Dr. Irving D. Johnson, Marin County health officer, resigned that post in February, and **Dr. Clarice Haylett,** a deputy in the health department, was named acting health officer by the county board of supervisors.

SAN FRANCISCO

Two grants of $25,000 each to be spread over a five-year period, one to the University of California Medical School and the other to Stanford University School of Medicine, were awarded last month by the John and Mary R. Markle Foundation for support of teaching and research work by a member of the faculty of each school. At Stanford the faculty member receiving the support is **Dr. Quentin B. Deming,** for study of heart and kidney disease; at U. C., **Dr. Thomas Timothy Crocker,** specializing in infectious diseases.

* * *

A refrigerated truck for use in delivering blood for transfusion at hospitals in Marin, Napa, Solano and San Francisco counties was put into service last month by the **Irwin Memorial Blood Bank.** The new truck will also be used as a mobile unit for procuring blood from donors in outlying communities. Twice-weekly deliveries of whole blood of all types will be made to hospitals in the area served so that they may have a supply on hand for immediate use when needed. The mobile unit was donated by the William G. Irwin Charity Foundation, one of the original sponsors of the blood bank.

The Stanford University School of Medicine currently is conducting its 68th course of **Popular Medical Lectures** at Lane Hall. The first of four lectures, "New Drugs in Tuberculosis" by Dr. H. Corwin Hinshaw, was given March 29. The schedule for the remaining three, which all begin at 8 p.m., is as follows: April 5, "The Present Day Treatment of High Blood Pressure," by Dr. Francis L. Chamberlain; April 19, "The Common Cold," by Dr. Rodney R. Beard; April 26, "ACTH, the Magic Hormone," by Dr. William C. Kuzell.

Announcement of the lectures says that "all interested are cordially invited to attend."

* * *

A 12-week postgraduate **course in psychiatry and neurology,** to be given in the period August 28 through November 17, has been announced by the extension division of the University of California Medical School. Classes are to be held at the Langley Porter Clinic daily Monday through Friday, 9 a.m. to 5 p.m., with special work Saturday mornings for part of the time. Further details may be had from Stacy R. Mettier, M.D., Medical Extension, University of California Medical Center, San Francisco 22.

SANTA CLARA

Establishment of the **Palo Alto Medical Research Foundation,** which will provide scientific and technical skill in working out research ideas proposed by physicians in practice, was announced last month. Dr. Marcus Krupp has been appointed research director of the non-profit organization, and Dr. Albert Snell director of clinical studies.

Laboratory and research equipment has been ordered and April 1 was set for the beginning of operation of the foundation, which is located at 333 Channing Avenue, Palo Alto.

SONOMA

Formation of the Sonoma County unit of the California chapter of the **American Academy of General Practice,** the twelfth such unit in the state, was announced last month by Dr. Francis Hodges, secretary of the state organization. Dr. Horace F. Sharrocks was elected president of the Sonoma unit at the induction meeting, which was attended by 25 physicians in general practice, and Dr. Robert L. Mollenhauer was elected secretary.

GENERAL

Continued opposition to socialized medicine was pledged by Lieutenant Governor Goodwin J. Knight in a statement issued in connection with his decision to run for reelection to the office he now holds. Text of the statement follows:

"My friends in the medical profession in the State of California have the right to know that my decision to run for reelection to the office of Lieutenant Governor has in no measure changed my views in opposition to socialized medicine.

"I will continue to oppose compulsory health insurance and the socialization of the medical profession at the state level, by whatever device or subterfuge it may be proposed.

"I oppose socialized medicine at the national level.

"Further, in my opinion, Federal subsidies to colleges are but another approach to the socialization of medicine.

"From what I have seen of the recent developments of voluntary health insurance plans, particularly the strides made by the Blue Cross and Blue Shield in offering individual coverage and protection against catastrophic illness or accident, I am more than reassured that the medical profession can and will solve the insurance question while still maintaining the highest standards of medical care the nation has ever known."

* * *

Employment openings for civilian physicians in the United States possessions of Guam and American Samoa, and in the Trust Territory of the Pacific Islands, were announced recently by the Department of the Interior which will assume administration of the islands, July 1, 1950, when they are removed from the jurisdiction of the Navy Department. Civilian personnel will replace naval officers, including medical officers, before the date of transfer. **Salaries** for physicians accepting appointment to any of the available positions range from $6,400 to $8,800 a year with 25 per cent additional as "post differential." Transportation is paid for employees and their dependents. Housing is available and rents, according to the Interior Department announcement, are "reasonable." Applicants need not be on a civil service register to be eligible for appointment.

* * *

A Northern California chapter of the **American College of Surgeons**, including in its membership surgeons in the area from the Tehachapis to the Oregon border, was formed last month.

Dr. Howard C. Naffziger, who presided at the organizational meeting as temporary chairman, said that the chapter was formed to meet "a general demand by surgeons for an opportunity to exchange ideas locally, in addition to sectional and national meetings held by the college." Dr. John W. Woolsey of Woodland was elected president of the new chapter.

* * *

Reappointment of three members of the **State Board of Medical Examiners** to terms expiring January 15, 1954, was announced last month by Governor Earl Warren. The three appointed are Dr. Norman B. Nelson, assistant dean of the Medical School of University of California at Los Angeles, Dr. Percival Dolman of San Francisco and Dr. William F. Quinn of Los Angeles.

* * *

The first issue of **Future**, a brochure for California medical students, interns and residents, came off the press last month. The new publication, which is to be issued bimonthly, is published by the California Medical Association to inform prospective members of the purposes and work of the Association. Besides a letter of greeting from Dr. R. Stanley Kneeshaw, president of the Association, the first issue contains a short history of C.M.A. and articles on medical economics and political activities affecting the future of medical practice.

The international and fourth American **Congress on Obstetrics and Gynecology** will be held at the Hotel Statler, New York City, May 14-19, 1950. Any doctor, nurse or professional worker interested in the fields of obstetrics, gynecology, public health work in maternal and child care, hospital administration or medical education in those fields, is invited to attend.

* * *

The American Physicians Art Association will have its 12th art exhibition in conjunction with the American Medical Association Convention at San Francisco Auditorium June 26 to 30, 1950.

Any physician who follows the hobby of fine or applied arts can exhibit at this convention by becoming a member of the A.P.A.A. and applying for entry blanks and shipping labels. Applications may be made to the secretary, F. H. Redewill, M.D., 526 Flood Building, San Francisco 2.

Over one hundred trophies will be awarded to advanced physician artists, as well as to beginners who have done art work less than two years.

* * *

The scientific program of the **California Heart Association** will be held at House of Hospitality, Balboa Park, San Diego, at 1:30 p.m., Wednesday, May 3, 1950.

William Paul Thompson, M.D., president of the association, and Mast Wolfson, M.D., chairman of the program committee, will preside.

The program follows:

1:30 p.m.—The Diagnosis and Treatment of Abdominal Aneurysms, Norman E. Freeman, M.D., and Rutherford S. Gilfillan, M.D., San Francisco.

1:50 p.m.—The Effect of Fluid and Electrolyte Changes on the Heart with Particular Reference to the Electrocardiogram, Helen E. Martin, M.D., and Ralph Homann, M.D., Los Angeles.

2:10 p.m.—The Renal and Biliary Excretion of Digitoxin in Man, Meyer Friedman, M.D., San Francisco.

2:30 p.m.—The Treatment of Resistant Strains of Streptococcus and Staphylococcus Bacterial Endocarditis with Antibiotic Therapy, George C. Griffith, M.D., Pasadena, David C. Levinson, M.D., Los Angeles, and Harold E. Pearson, M.D., Los Angeles.

2:50 p.m.—Electrocardiographic Clinico-Pathological Conference, Francis L. Chamberlain, M.D., San Francisco, William Paul Thompson, M.D., Los Angeles, and Maurice Yettra, M.D., Los Angeles.

3:20 p.m.—Business Meeting.

3:30 p.m.—Recess.

3:45 p.m.—The Electrocardiographic Diagnosis of Acute Cor Pulmonale, Maurice Eliaser, Jr., M.D., and Frank Giansiracusa, M.D., San Francisco.

4:10 p.m.—Panel: Congenital Heart Disease, Charles Baker, M.D., Lewis T. Bullock, M.D., L. Henry Garland, M.D., John Jones, M.D., and Louis E. Martin, M.D.

INFORMATION

Health Insurance, the C.M.A. and the Governor

Medical organizations throughout the country have consistently supported voluntary health insurance and opposed the inauguration of compulsory health insurance schemes or socialized medicine. Their reasons for this attitude have been restated so many times they need no repetition here. Rather, these reasons may be boiled down to three fundamentals: (1) the effort to *increase the quantity* of medical care through governmental taxes and governmental dispensing of the service is bound to result in a *decrease or deterioration of the quality of the service;* (2) the costs of government-controlled medical care are higher, and (3) there is no need for such a system in this country. The Brookings Institution in its studies has stated that "probably no great nation in the world has . . . better health than prevails in the United States. . . . It is apparent that the United States under its voluntary system of medical care has made greater progress in the application of medical and sanitary science than any other country."

The California Medical Association has not only joined the ranks of the opponents of socialized medicine, it has consistently been a leader in espousing the cause of progressive medical care of good quality under the voluntary system. Accordingly, its position should be made clear to its members, its friends and its opponents in the struggle of voluntary vs. compulsory health insurance.

Specifically, Governor Warren has recently been reported as having accused the California Medical Association of not being willing to meet with him to discuss his proposals for a system of tax-supported medical care. He has also charged that the position of the Association is inconsistent with its earlier determinations, particularly with a movement under taken in 1935, when representatives of the C.M.A. temporarily endorsed a compulsory sickness cost tax measure in the State Legislature.

These two charges will bear inspection . . . and rejection.

First, an examination of the 1935 legislative situation should be made. Many California physicians remember this episode but time dulls the memories of details and a recital of the facts at this time may serve to refresh many minds on matters which have grown hazy.

An interim committee of the California State Senate, under the chairmanship of Senator Ed Tickle of Carmel, was exploring the cost of medical care in 1934 and early 1935. As a part of its study, the committee was preparing a bill for introduction in the Legislature, a bill to set up a system of taxation, the proceeds of which would have been used to pay all medical and hospital costs of the people of California. In short, the bill would have established a system of compulsory health insurance almost identical to the systems proposed in the past few years by Governor Warren and by Presidents Roosevelt and Truman.

Senator Tickle and his committee's consultant, Mr. C. J. Sullivan, reached the ears of some California physicians and impressed upon them the "inevitability" of such legislation. Since such a bill was bound to be adopted, they argued, the physicians should participate in it rather than oppose it. The initial approach was one of "inevitability," the follow-up one of appeasement. At that time there were no voluntary plans for the physicians to follow.

Impressed with these arguments, these physicians took the story before a special meeting of the C.M.A. House of Delegates on March 2 and 3, 1935. For two days the House of Delegates discussed voluntary and compulsory forms of health insurance, winding up with an endorsement of the compulsory health insurance recommended by the Senate Interim Committee. The voting was close on this issue and keen reception was given to a minority committee report which recommended the establishment of a voluntary system.

The special session of the House of Delegates again brought forth the argument of the "inevitability" of compulsory health insurance. Beyond that, it stressed the low level to which the economy of California and of the nation had sunk in the 1930-1935 depression. Most important, it sounded the beginnings of a voluntary health insurance plan (the minority committee report) which flowered four years later into California Physicians' Service.

Acting on the resolutions of the House of Delegates, a special committee met with Senator Tickle's committee and worked out a draft of a compulsory health insurance bill, which was introduced in the Legislature on behalf of the interim committee.

In the Legislature, this bill immediately proved to be an extremely unpopular piece of legislation. *It was attacked by labor, business and agricultural interests.* It got nowhere in the Legislature and ended up with only its authors and a handful of physicians in favor of it.

If the compulsory health insurance proposal received a cold shoulder in Sacramento, it did even worse among the members of the California Medical Association. Spontaneously, an organization sprang into being, statewide, to determine the collective opinion of the physicians of the state on a measure of this kind. A statewide poll of physicians was taken and more than 90 per cent of them voted in opposition to it.

Here was proof, direct from the physicians, that they didn't want compulsory health insurance in California. The C.M.A.'s House of Delegates, under the persuasive influence of able oratory, had voted in favor of a compulsory bill but the physicians back home were voting in opposition. Medical opinion was opposed, a fact which supported the stand of labor, business and agriculture. California was not ready to embrace the socialistic experiment of compulsory health insurance.

A year later, in the 1936 House of Delegates meeting, two of the earlier proponents of the compulsory bill offered their apologies to the House for having supported this movement and publicly recanted their earlier stands. The 1936 session unanimously adopted a resolution in favor of a voluntary form of health insurance. The 1935 chapter was closed.

As to the other proponents of the compulsory system in the 1935 special meeting, it is interesting to note that their constituent county societies did not return them to the House of Delegates. Their influence gone, they lapsed into silence and, with few if any exceptions, have not been heard from since that time. Their "experiment" had failed.

Here is the story. Pieces of it, taken out of context, may be misleading; taken in its entirety, it shows nothing more than that the combination of a depression, powerful oratory and a fear complex born of the alleged danger of "inevitability" may lead even a thinking group of professional men to adopt measures which cannot stand the test of mature reflection.

* * * *

Next comes an examination of Governor Warren's claim that the California Medical Association is not willing to sit down with him to discuss his proposals for health insurance legislation. Again, a review of the history may be helpful to an understanding of the situation as well as the Governor's claim.

In November 1944 the Governor sent an emissary to see the late Dr. Philip K. Gilman, then chairman of the C.M.A. Council, who at the time was confined to Oak Knoll Naval Hospital, Oakland, following an operation. The emissary carried back to the Governor Dr. Gilman's invitation to see him in person, which he did.

Governor Warren related to Dr. Gilman his plan for initiating compulsory health insurance legislation, again stressing the "inevitability" of such legislation and expressing his own desire to get ahead of the State CIO Council, which was reportedly drafting legislation of this kind for introduction in the 1945 Legislature. Dr. Gilman, realizing the gravity of the Governor's proposal, suggested that a special meeting of the Council be called to hear the Governor's proposal. Governor Warren agreed to attend such a meeting and accepted the Association's invitation to a luncheon meeting at the Family Club, San Francisco, on December 13, 1944.

There the Governor repeated what he had told Dr. Gilman, namely, that the State CIO Council was going to introduce compulsory health insurance legislation, that he felt such legislation was bound to pass, that he wanted to get ahead of the CIO and that the doctors ought to embrace the opportunity to work with him in drafting a health insurance bill which would be acceptable to the medical profession.

Lengthy discussion followed, during which time the Governor reiterated his belief that such a plan must be compulsory in nature. He also stated his belief that the voluntary plans were doing their best but would and could never cover the number of people that a tax-supported compulsory system would cover.

The Council pointed out to the Governor the tremendous responsibility entailed in fostering any such plan as he was suggesting. The physicians on the Council felt this responsibility as individuals and as a Council and made it clear to the Governor that he was taking a lot upon himself to offer one type of medical care program as the only solution to the problem of the distribution of medical care.

A combination of the voluntary and compulsory systems was discussed as a possible solution to the problem but the Governor stated his belief that such a system would be impossible and probably unconstitutional. His one theme was that the State had to do the job and nothing short of a state-operated plan would be acceptable to him. He also repeated his earlier statement to the effect that any plan to be offered by the CIO would probably be a bad plan and that he wanted the doctors to work with him in producing a better one.

Governor Warren was then told that the subject was too important for the Council to decide, that a special meeting of the House of Delegates would be necessary and that such a meeting would be called for the earliest practicable date. He was invited to attend and address this meeting and stated he could include in his message to the Legislature the decision reached by the House of Delegates if this information reached him within a few hours of the time he was scheduled to deliver his message to the convening session of the Legislature on January 8, 1945. The meeting ended with the agreement that neither side would issue any publicity.

Despite wartime restrictions on travel and on conventions, a special meeting of the House of Delegates was immediately called, to convene in Los Angeles on January 4 through January 6, 1945. The Governor was invited to attend in person or through a representative but declined on grounds he was too busy, as was his staff, in preparing for the legislative session.

On December 30, 1944, California newspapers carried the story of the Governor's press conference of the day before. The one big item coming out of this conference was Governor Warren's announcement that he was having a compulsory health insurance bill prepared for introduction in the Legislature, that he felt such a bill was needed and was confident it would be adopted. This announcement was made *after the C.M.A. had set the dates for its special*

House of Delegates meeting but before the meeting was held.

The House of Delegates met in Los Angeles for three days, heard discussions of health insurance by representatives of the State CIO Council and the California State Federation of Labor (A. F. of L.) and debated at length on various proposals offered by officers of the Association and members of the House. Representatives of dental, nursing, hospital and pharmaceutical associations were also present and were given the opportunity to express their views.

Finally, without a dissenting vote, the House agreed to oppose any program of compulsory, tax-supported health insurance which had been offered to date and, instead, to foster the voluntary forms of health insurance. The Governor was conspicuous by his absence.

Following that decision, the Council of the Association reviewed the mandate of the House of Delegates and proceeded to implement it. Public relations counsel were employed. A campaign in favor of voluntary health insurance and against compulsory health insurance was planned. The negative side of the campaign was directed at both the Governor's bill and that of the CIO; interestingly enough, despite the Governor's prediction on December 13, 1944, that the CIO bill would necessarily be a bad bill, the two measures before the legislature were identical in all essentials and different only in details.

The result of this campaign is well known. Both bills failed to clear their first hurdle in the Legislature; neither one got out of committee. Both died with the end of the session, and with their death the first chapter of Warren health insurance legislation was concluded.

Before the close of the 1945 legislative session, however, various conferences were held with Governor Warren by officers and members of the California Medical Association. Many of these meetings were at the invitation of the Governor, called as informal conferences but fraught with all the possibilities of engendering formal action by the C.M.A. Personal friends, neighbors and former classmates were among those who conferred with the Governor. In each instance, the same reply came back from the Governor: The compulsory system of socialized medicine was the only plan that would work and the only one the Governor would or could support. The argument of "inevitability" was also repeated.

The following year, 1946, several formal meetings were held with the Governor by the C.M.A. Early in January, the Governor was invited to a small meeting at the Bohemian Club in San Francisco, when an entire evening was spent discussing health insurance. The Governor complained of the manner in which his legislative efforts had been treated by the C.M.A. and reiterated his beliefs in a compulsory system of socialized medicine, in the certain failure of the voluntary plans to do the job and in the inevitability of compulsory health insurance on a state or federal level. His own choice was to effect this type of legislation on a state level.

In May 1946 the Council devoted an entire morning to an executive session with Governor Warren, a meeting requested by some of the Governor's physician friends in Sacramento. Governor Warren then stated that he had no prepared address to make but would prefer a question-and-answer session. His answers to the numerous questions asked have been carefully recorded and they leave no doubt that he was still of the same opinion as in 1945. He still believed only in a compulsory health insurance system; he still believed that the voluntary systems would never cover the population nor do the job he wanted done.

On October 23, 1946, almost every member of the Council traveled to Sacramento (for the Governor's convenience), went through the Governor's office and proceeded to a meeting at the Sutter Club, where a further discussion of health insurance was held. The Governor's attitude and answers remained unchanged.

Again in 1947 and again in 1949, Governor Warren caused his health insurance bills to be introduced in the Legislature. The 1947 version was somewhat different from the 1945 model; the 1949 bill was identical, word for word, with the 1947 bill. In each session the bills were defeated in committee; as time passed, the support which the Governor originally had seemed to disappear. The legislature was satisfied with the progress of the voluntary plans.

The previously mentioned meetings in 1945 and 1946 are cited here to refute that claim. Each and every one of them produced the same negative result — Governor Warren was unwilling to discuss health insurance on any terms except his own. He was unwilling to grant the voluntary systems of health insurance any place in the health picture. He was unwilling to consider any proposal short of a state-dominated, tax-supported system of socialized medicine such as he was proposing.

From 1947 to 1950 the Governor made not one move to sit down and discuss the problem with the C.M.A. The California Medical Association has had no communication from him although on occasion he may have consulted individual members of the Association.

Penicillin for Treating V. D. in Indigent Patients

Penicillin for use in the treatment of indigent or part-pay patients with syphilis or gonorrhea is available free of charge to physicians in California, provided report of the case in each instance has been made to the health department on the usual morbidity report card. The penicillin for this purpose is supplied by the California Department of Public Health to local health officers, who dispense it to physicians requesting it.

Explaining the service, Dr. Malcolm H. Merrill, deputy director of the California Department of Public Health, said in a letter to Dr. L. A. Alesen, chairman of the C.M.A. Committee on Public Health and Public Health Agencies, that "it was designed as a partial subsidy to physicians to assist in having a larger percentage of the cases taken care of in the physicians' private offices and thereby cutting down requirements for clinic attendance. It is, of course, evident that the Department, by necessity, must take the physician's word for the indigency or part-pay status of the cases for which he requests drugs. In our past experience in the distribution of arsenicals, this has never seemed to present a particular problem."

Procaine penicillin in oil with 2 per cent aluminum monostearate, 300,000 units per cc. in 10 cc. vials, is available for the treatment of syphilis. The maximum amount of penicillin dispensed for a single syphilis patient at one time will be three vials.

Procaine penicillin G, 300,000 units per cc. with crystalline penicillin, 100,000 units per cc., for aqueous injection, the so-called "soluble repository" product, giving a 24-hour blood level, is available in 1 cc. individual dose vials for gonorrhea.

Hypnotic Drugs Licensing Requirements

The following interpretation of a section of the so-called Hypnotic Drugs Act passed by the 1949 session of the California State Legislature has been issued jointly by Howard Hassard, attorney for the California Medical Association, and Anthony J. Kennedy, attorney for the Southern California Dental Association and the California State Dental Association:

"Re: Interpretation of Senate Bill 1005,
Chapter 993, Hypnotic Drugs.

"There has been a great deal of misunderstanding and misinterpretation of the provisions of the 1949 legislation known as the 'Hypnotic Drug Bill'. The impression has been given to some members of the medical and dental professions that anyone who dispenses or administers any hypnotic drug, even to his own patients, must have a separate license and prescription blanks issued by the Pharmacy Board.

"Because of the misinterpretation and uncertainty that exists concerning the proper application of this legislation, the undersigned attorneys for the California Medical Association and Southern California and California State Dental Associations are issuing this joint opinion to the professions, that physicians and surgeons and dentists are exempt from the licensing provisions of the hypnotic drug legislation of 1949 except in the single case where the licensee also operates a pharmacy or *fills* prescriptions of others.

"Therefore, if, as a physician and surgeon or dentist, you do not also operate a pharmacy or fill prescriptions of others, it is unnecessary that you take out a hypnotic drug license under the Pharmacy Act. It is anticipated that official confirmation of this opinion will be forthcoming shortly."

BOOK REVIEWS

THE SEXUAL CRIMINAL—A PSYCHOANALYTICAL STUDY. By J. Paul de River, M.D., F.A.C.S., Criminal Psychiatrist and Sexologist, Los Angeles Police Department, Consultant Alienist to the Superior Courts, City and County of Los Angeles. Charles C. Thomas, Publisher, Springfield, Illinois, 1949. $5.50.

The book contains many case reports of "sexual criminals," many photographs of victims. "Psychoanalytical study" is a misnomer. The author gives few if any *findings* to indicate that such studies were made. *Rather*, he gives his *interpretations* which would not appeal to orthodox psychiatrists and which would not satisfy qualified psychoanalysts.

Many of his statements are not in accord with the facts nor with the views of authoritative psychiatry. He states that "sexual psychiatry is not included in the curriculum of medical schools." He allows an attorney who writes his introduction, to state that most psychiatrists consider sex perverts afflicted with insanity; and that no particular effort is made to classify perverts. There are many statements which would make even little informed readers close the book.

In many places it is difficult to find what the author is talking about. For example, "man stands in opposition to himself, in otherness than himself."

Many cases are reported with questions and answers developed in interviews. There is nothing psychiatric or psychoanalytical in these interviews.

This book adds little if anything to one's library of the many authoritative texts which have appeared in the last 40 years.

* * *

RECENT ADVANCES IN PHYSIOLOGY. By W. H. Newton, M.D., M.Sc., D.Sc., Professor of Physiology in the University of Edinburgh. Seventh Edition, The Blakiston Company, Philadelphia, 1949. $4.50.

In this small book, the last edition of which appeared ten years ago, one finds several subjects reviewed critically. Its contents may best be indicated by a list of chapter headings: The Physical Basis of Temperature Regulations, Water Diuresis, Digestion, Some Aspects of the Physiology of Pregnancy, Blood Pressure and the Kidneys, Catheterization of the Heart, The Electrical Excitation of Nerve, Cutaneous Sensation, Auditory Impulses and Color Vision. Some of the chapters stress very recent work, others reach back a decade; most are more than adequate to accomplish the author's purpose of indicating "certain modern currents of thought." The volume is recommended to medical students, physiologists, and those physicians interested in fundamental aspects of the cited topics.

* * *

FROM THE HILLS—An Autobiography of a Pediatrician. By John Zahorsky, M.D. The C. V. Mosby Company, St. Louis, 1949. $4.00.

John Zahorsky has long been a familiar figure in American pediatrics and is perhaps best known to the profession for his early description of an acute exanthematous disease of early childhood known variously as roseola infantum, exanthem subitum and rose rash, and sometimes called Zahorsky's disease. Born in Hungary in 1871, he came to America at the age of six months. He took his medical degree in 1895 and after a period of general practice confined his professional work to pediatrics beginning in 1905. He was active in medical teaching in St. Louis at the Missouri Medical College and its successor, the Medical School of Washington University, and later became professor of pediatrics and director of the department at St. Louis Medical School, in which he is now professor emeritus. He is the author of a Synopsis of Pediatrics, of a text on pediatrics and of a number of medical papers.

The autobiography relates the author's early experiences incidental to the life of an immigrant family during pioneer days, his professional training, teaching and practicing career and his many avocational interests. The book is written entertainingly, with many anecdotes and bits of poetry by himself and others. Its descriptions of men who stimulated and inspired him, particularly Dr. E. W. Saunders of St. Louis, and of his difficulties and triumphs in improving medical education, hospital facilities and child care in St. Louis, are of considerable general interest. Much of the book, unfortunately, will appeal only to those who are or have been intimately associated with the author.

* * *

ESSENTIALS OF OBSTETRICAL AND GYNECOLOGICAL PATHOLOGY. By Robert L. Faulkner, M.D., Assistant Professor of Gynecology, and Marion Douglass, M.D., formerly Assistant Professor of Gynecology, both at The Western Reserve Medical School. 300 illustrations, including 3 color plates. Second Edition. The C. V. Mosby Company, St. Louis, 1949. $8.75.

This edition of this popular textbook of Obstetrical and Gynecological Pathology is a great improvement over the first edition. The text matter has been carefully revised, and numerous ambiguities have been clarified. The balance throughout the work seems to be good as far as emphasis is concerned, with the single exception that the pathology of pregnancy seems to be somewhat abbreviated and with definite omissions. The section on ovarian tumors is especially good, and the same may be said of the section on the endometrium.

This is an excellent textbook for the student and for the specialist who is interested in refreshing his mind with regard to pathological entities.

If one were to criticize, one would say that in a book dealing with histological detail, illustrations can not be too good. I suppose that one will never again see a publication such as Liepmann's Handbuch, with its beautifully detailed colored drawings. However, one could wish that now and then drawings could be included to elucidate illustrations where microphotographs do not quite meet the expectation.

* * *

THE QUESTION OF LAY ANALYSIS—An Introduction to Psychoanalysis. By Sigmund Freud — translated by Nancy Procter-Gregg. W. W. Norton and Company, Inc., New York, 1950. $2.50.

This short book is a very adequate translation of a plea by Freud on behalf of lay analysts. It is, however, of much greater interest to the physician than that, since it presents in brief and comparatively simple form, from the mouth of the founder of psychoanalysis himself, the basic concepts of this discipline. It cannot be truthfully said that after reading this book the physician untrained in psychological medicine will have a clear understanding of Freudian principles. However, the amount of such understanding per unit time spent in reading will be far greater than in any other other work known to this reviewer.

The form of presentation is that of the "Socratic inquiry," in which questions put by a hypothetical impartial enquirer whose object is to ascertain whether laymen should be allowed to practice psychoanalysis are answered by the author. Naturally, no questions will be asked that Freud did not feel competent to answer in a favorable light, but nevertheless in the course of the inquiry much can be gained of insight into both psychoanalysis and its founder. The physician will be well repaid for an hour or so devoted to the perusal of this book.

* * *

MALARIA—THE BIOGRAPHY OF A KILLER. By Leon J. Warshaw, M.D. Rinehart & Company, New York, 1949. $3.75.

This agreeable book is a well written and none-too-accurate account of certain phases of malariology written for popular perusal with rather a dearth of scientific emphases and fact. It is an entertaining disquisition on certain selected by-paths and historical associations of malaria, not complete and detailed enough to tempt the medical or scientific reader, and not perfused with the original philosophy and broad integrative analysis of a Zinsser. It seems to be the product of an author quite out of touch with the social and historical story of malaria. It is to be commended for the medical reader who wishes a pleasing presentation of part of the tremendous record of malaria, and does not object if that presentation is unbalanced or lacking in systematic coverage. The undue space given cinchona and quinine suggests library review rather than living acquaintance with the subject.

* * *

PHYSIOLOGY OF THE NERVOUS SYSTEM. By John Farquhar Fulton, O.B.E., M.D., D.Sc., LL.D., Sterling Professor of Physiology, Yale University. Third Edition, Revised. New York, Oxford University Press, 1949. $10.00.

The justification for a third edition of this now standard American text on neurophysiology is well presented by the author in the preface, where those changes and additions worthy of note are outlined. They are, in brief, the discovery of the secondary motor and sensory areas in the cortex, the importance of the reticular formation, the role of the orbital surface of the frontal lobes and the cingulate gyrus in autonomic function, functional localization in the anterior cerebellum, and the importance of rate of stimulation on the character of response.

This book, as it has passed through succeeding editions, has lost some of the personal bias of the author and become more truly representative of general thought in neurophysiology. In this regard, reading the section dealing with transmission of the nerve impulse across the synapse has much interest, showing as it does the author's changing opinion on the subjects, brought about by closer association with those who have developed the theory of humoral transmission.

Although rather bulky and complex for the student, there is no comparable work in English for use as a student text. It is of even greater value as a reference, and this has been enhanced by being brought again up to date.

* * *

PHYSIOLOGY OF THE UTERUS. By S. R. M. Reynolds, M.A., Ph.D., Staff Member, Physiologist, Department of Embryology, Carnegie Institution of Washington. Second Edition. Paul B. Hoeber, Inc., New York, 1949. $12.50.

The first edition of this excellent book appeared in 1939 and contained a bibliography of 1,190 items. The new edition is a much larger volume, both in number and size of pages, and the total list of references approaches 2,500. There has been a marked change in the organization of the book, the second edition containing eight major divisions instead of 13 chapters as in the original work. The various parts contain anywhere from one to nine chapters and the bibliography appears sectionally at the end of each of the eight parts. The subject headings scattered through the bibliographic pages are a great help and this feature of the new edition is a decided improvement. A good deal of new material has been added, particularly with regard to human tokography using strain-gauge dynamometers, steroid hormones during pregnancy, experiments in the production of abnormal types of uterine growth, myometrial forces in parturition, vasculature of the uterus, and placental exchange. The chapters on menstruation and on fetal circulation have been expanded, and there is additional discussion of factors determining fetal maturity at birth and uterine accommodation to the gestational product. Virtually all of the illustrations are new.

It is obviously impossible to describe the subject matter of such a comprehensive volume in a few words. Suffice it to say that the book covers its stated subject in a thorough and admirable fashion. Besides a mere recitation of the recorded facts, it contains excellent interpretations of the data presented and the whole is written in a lucid and pleasing style by an authority of first rank. The publisher has done a splendid job with the printing and reproduction of the illustrations. In brief, this is a superb volume and one which should be read by all who are interested in obstetrics, gynecology, physiology or endocrinology. Owners of the first edition will not need to be urged to buy the second, which for all practical purposes is an entirely new book. Those who may have overlooked the first edition should procure the new one without delay.

* * *

THE DEVELOPMENT OF GYNAECOLOGICAL SURGERY AND INSTRUMENTS—A Comprehensive Review of the Evolution of Surgery and Surgical Instruments for Treatment of Female Diseases from the Hippocratic Age to the Antiseptic Period. By James V. Ricci, M.D., Clinical Professor of Obstetrics, New York Medical College. The Blakiston Company, Philadelphia, 1949. $12.00.

Your reviewer has not had an easy time to work his way through the 594 pages of the archaic and neo-archaic substance that fills this recent compilation of historical data from the pen of James V. Ricci, to whom this kind of literary pursuit seems to have a particular attraction. At best it is a dry and musty job to dig up a multitude of details heavily dimmed by a long and almost forgotten past that bears rather lightly on the present, and historical data pertaining to the practice of gynecology are no exception. In turning out such an opus the author has done a good job at digging up facts. In his preface he states that it is with some diffidence that he presents his text to the reader, lamenting that the present generation of gynaecologists (author's spelling) "struggling for progress, and in truth taxed to keep up with the ever increasing knowledge loosed by new drugs and operative technics, has seemingly turned its back on the past. However, it is believed, that there is something of value for gynaecologists with leisure and taste in the historical background of their specialty." To which your reviewer adds a faint "Amen," after lamenting on his own that it is not new drugs and the steady flow of new techniques which make gynecologists look to the present at the expense of the past, but the habit of modern man to bury the past six fathoms deep hardly before it has breathed its last sigh, for the days of leisure, and perhaps of taste, are mighty few in this fast age, obiter dictum.

In presenting The Development of Gynaecological Surgery and Instruments to the profession, Ricci has gone well beyond the intended scope of the essay by delving deeply into the many forms of general therapy employed by the ancients. It seems quite evident that he did so to emphasize more forcefully the development of certain methods and traditions in gynecology. After completing the perusal of the book, your reviewer concluded it presented a detailed historical account of the evolution of the gynecologic specialty rather than just a story of the development of techniques and instruments.

The book contains a multitude of minor and major events in the development of gynecology compiled in chronologic order and documented in the most precise and elaborate fashion quite in the manner of the great German handbooks and in many respects equally dry as far as the presentation of the subject is concerned. That is why your reviewer stated in his introduction that he found it not easy to stick to the job. The author seldom, if ever, ventures an analysis or a philosophic approach to his subject. He just recites facts as they have been recorded over the centuries. Any reading matter as encyclopedic in character makes for dry reading. Yet, there is real merit to Ricci's labors, for the compilation of the reference material alone is worth the price of the book for anybody interested in the history of medicine in general and in gynecology and obstetrics in particular. It would be interesting to know how long it took to complete the job of putting the material into readable form and how many helpers it required to abstract the vast number of references cited. There are several thousands of them and many are given verbatim. Besides, the book teems with illustrations taken from the great standard works on medical history, sometimes with needless duplication, but always reproduced with faultless precision. Also that makes the book an attractive item for any reference library.

Your reviewer has wondered why Ricci insisted on spelling gynecology, "gynaecology" throughout the book. The British do for reasons of tradition. American medical English has done away with it. Perhaps the author did it to reflect the antiquity of his subject. That is the way of man. Twelve dollars is a most reasonable price for Ricci's monumental compilation. Your reviewer recommends it as a valuable addition to your learned library.

* * *

THE EYE AND ITS DISEASES. By 92 International Authorities. Edited by Conrad Berens, M.D. Second Edition, with 436 illustrations, 8 in color. W. B. Saunders, Philadelphia, 1949. $16.00.

This book is in its second edition with a new type of format. The contributors are leaders in the field of ophthalmology, which in itself indicates the type of subject matter in the book.

The arrangement of the index and the subject matter makes this book unusually readable. The book is divided into 76 chapters with 92 contributors.

The book begins with an interesting resumé of ophthalmology from 2250 B.C. to 1949 A.D. The subject matter is very inclusive although not detailed. The print is easily read and the subject matter unusually well arranged.

This is an excellent book for a busy clinician as well as a student.

* * *

AN ATLAS OF THE BLOOD AND BONE MARROW. By R. Philip Custer, M.D., Director, Laboratories of the Presbyterian Hospital in Philadelphia; Assistant Professor of Pathology, University of Pennsylvania School of Medicine; Consultant to the Armed Forces Institute of Pathology. 285 illustrations, 42 in color. W. B. Saunders Company, Philadelphia, 1949. $15.00.

This volume is apparently intended to supplement rather than to replace previous hematologic atlases. Nevertheless, it is a major contribution to the literature since it represents the summation of a long and thoughtful experience in the pathologic diagnosis of hematologic disorders. Although the author recognizes the value of marrow smears and imprints for the study of precise morphologic details, the emphasis has been placed on the examination of fixed sections of the bone marrow. No differential counts of bone marrow smears are included, since the author questions their value and is convinced that any significant deviation from the normal can be appreciated without such counts. Many hematologists would not agree with this viewpoint.

Although this is primarily an atlas, the text material relating to embryonic and postnatal hematopoiesis in normal and pathologic conditions is adequately summarized. The meagre bibliography is not a defect in a text of this type.

There is probably basis for argument as to the relative merits of photomicrography and the more idealized presentation of the medical artist. Each has its advantages and disadvantages. In this volume, the author has relied almost exclusively on photomicrography. There are several striking bas-relief photographs showing structural abnormalities in the erythrocytes. An excellent selection of black and white and of colored illustrations of blood and bone marrow smears is presented. In addition, there are many illustrations of fixed sections of the bone marrow, chiefly in black and white.

This volume should help to narrow the gap existing between the clinical hematologist and the pathologist, the former having traditionally relied more on bone marrow smears and the latter on fixed sections of marrow for diagnostic material.

Unfortunately, the only description of the morphology of the various cells which is given in the text is a transcription of the preliminary report on terminology of the committee sponsored by the American Medical Association. That report was intended only to clarify certain points relating to terminology and is not an adequate guide for the student. Furthermore, the volume contains no systematic presentation of illustrations showing the developmental characteristics of the various cells engaged in normal and abnormal hematopoiesis. Rather casual references to morphologic characteristics of cells are made in some of the illustrations. These omissions will limit the usefulness of this volume for those lacking some previous knowledge of blood and bone marrow morphology.

* * *

ESSENTIAL UROLOGY. By Fletcher H. Colby, M.D., Chief of the Urological Service, Massachusetts General Hospital. The Williams and Wilkins Company, Baltimore, 1950. $8.00.

This book, as the author explains in his preface, is not presented as a complete textbook in urology. It is, however, a very valuable volume, and far more than a mere outline of the subject. In almost all respects it will be found quite adequate for the students of medicine for whom it is primarily intended. It will also make an excellent reference book for schools of nursing, while the physicians in general practice will find in it simple descriptions of several conditions which, while not infrequently seen by the specialist, are practically unknown to the profession generally. Excellent examples are such diseases as interstitial cystitis and granular urethritis in the female and Reiter's disease and amicrobic pyuria in the male. Even the urologist will find these more completely discussed than in many of his textbooks.

The work is well written and arranged, easy to read and understand. The typography is good and the many excellent illustrations are well chosen and fitted to the text. There is an adequate index.

Some sections of the book deserve more than casual mention. The one on renal calculi is particularly good. A great deal of space is given to the etiology of calculous disease, and the emphasis on the metabolic factors probably reflects the influence of Albright and his associates. The sections on neoplasms of the various genito-urinary organs are also unusually good, with excellent descriptions of gross and microscopic pathology. The chapter on tuberculosis at the end of the book is almost a classic.

Two important criticisms can be made. There is a tendency to streamline the discussion of some subjects too much. The physiology of urinary secretion deserves more than the scant one and one-half pages it receives, and certainly the discussion of such an important subject as acute pyelonephritis should not be compressed into two pages. The more obvious defect is that one is disappointed to find so little attention to treatment. The author obviously anticipates this complaint, and attempts to explain it by saying that he prefers to emphasize basic principles, that the work is primarily for students, and that "treatment is ever changing." However valid these arguments, one cannot avoid feeling that a little more attention on that point would make the book somewhat more valuable even to the students and certainly to the clinician.

In spite of these minor defects the book creates a very favorable impression. It is really unique in its field, and should definitely be in the library of every hospital and medical school. The general practitioner and even the urological specialist will also find it well worth owning.

* * *

THE PREMATURE BABY. By V. Mary Crosse, O.B.E., M.D. (London) D.P.H., M.M.S.A., D. (Obstet.) R.C.O.G., Full Time Officer, Birmingham Regional Hospital Board. Second Edition. The Blakiston Company, 1950. $2.75.

"The Premature Baby" by Mary Crosse is a delightful study of prematurity in another country. It should be especially helpful to the western population of the United States where there are still large, sparsely populated areas in which it is almost impossible to have the same type of premature nursery as the modern American hospital of the large city has. The book is a marvelous revelation of what can be done with minimal means.

The book contains detailed information on the premature baby, his size, weight, proportions, vitality, respiratory, circulatory and digestive difficulties, and then continues with the setup of wards with minimal apparatus, the technique of protecting the baby from infection, feeding the premature baby, clothing and dressing him, methods of keeping the crib warm, supplying oxygen without all the modern paraphernalia. There is a chapter on diseases and anomalies of the premature and a final chapter on statistics from various countries.

It is a book well worth having in every nursery and makes an excellent reference book for practitioners in the small towns and rural communities.

* * *

A TEXTBOOK OF SURGERY BY AMERICAN AUTHORS. Edited by Frederick Christopher, B.S., M.D., F.A.C.S., Professor of Surgery, Northwestern University Medical School. 1,465 illustrations. Fifth Edition. W. B. Saunders Company, Philadelphia, 1949.

This textbook of surgery remains as "tops" among the surgical textbooks. The contributors of previous editions were a veritable "Who's Who" in the teaching of surgery. To the fifth edition there have been added other illustrative names and chapters. Among others may be mentioned the chapters on The Esophagus by Dr. Richard Sweet; Gastric Hemorrhage and Wounds by Dr. Robert M. Zollinger; Gastric Ulcer by Dr. Arthur W. Allen and Claude Welch; Surgical Diseases of the Pancreas by Dr. Alexander Brunschwig; Urologic Diagnosis by Dr. Reid N. Nesbit, and many others of prominence.

It is noted that contributors to older editions have revised their particular chapters to conform with newer developments. One might appreciate a change of illustrations by some of the older contributors as some of the illustrations and pictures have appeared through quite a number of editions. As in previous editions, the textbook does not cover more than the essentials of surgical technique. The book was not intended to emphasize techniques of surgery but to give a general review of the latest developments in surgery. This is covered in the usual excellent manner of presentation found in previous editions.

* * *

SELECTED PAPERS OF HAVEN EMERSON, A.M., M.D., D.S.M. Published on the Occasion of his Seventy-Fifth Birthday by the W. K. Kellogg Foundation, Battle Creek, Mich. 1949. $3.00.

One of Emerson's intimates has termed him the General Practitioner of Public Health. These 39 papers selected from a bibliography of over two hundred highlight many facets of his versatile career. They cover laboratory and epidemiological studies, community health organization, public health and visiting nursing, hospital problems, mental hygiene twenty years before it became fashionable, medical student instruction and many other subjects. The writings are superb literary compositions in the tradition of the Emersons. They are a combination of prophecy and hard-headed New England practicality demanding first things first. They reflect his years of private practice which have made his counsel so valuable in representing the points of view of practicing physicians. While of primary interest to public health workers, this collection will enable all general practitioners to appreciate their bond with this great general practitioner of public health. It is a fitting tribute to Dr. Emerson, whose contributions continue undiminished.

An additional contribution of Dr. Emerson which will soon be published should be mentioned here. The seventh edition of "The Control of Communicable Diseases," like the preceding six, will be Dr. Emerson's product, summarizing the current knowledge and most widely accepted bases of control of communicable diseases. It and the "Selected Papers of Haven Emerson" will be worthwhile 1950 acquisitions to every physician's library.

* * *

DIAGNOSIS AND TREATMENT OF BRAIN TUMORS AND CARE OF THE NEUROSURGICAL PATIENT. By Ernest Sachs, M.D., Research Associate in Physiology, Yale University; Formerly Professor of Clinical Neurological Surgery, Washington University School of Medicine, St. Louis. Second Edition. The C. V. Mosby Co., St. Louis. 1949. $15.00.

This is the second edition, after 17 years, of a good book. Printing and format are adequate. There are 358 illustrations. Most of these are good. Some are atrocious. Particularly, this reviewer wishes that publishers would reproduce roentgenograms as they appear in front of a viewing box, not "in reverse."

The book's value to a general physician or surgeon can best be approached by stating that, in the reviewer's experience, general men referring patients to a neurological surgeon fall into two main groups: Those who want, at the earliest opportunity, to be relieved of an onerous responsibility; those who want to know what the referred patient is "up against," what his chances are, what is going to happen to him. For referring men in the second group, Dr. Sachs has a lot of information—not only about what is in store for the patient, but about the agony that a conscientious neurological surgeon may experience in deciding upon and carrying out the program.

For neurological surgeons (now almost as numerous as general practitioners in California) the book has an especial value based on two considerations. Dr. Sachs is a man of extensive experience; he is forthright and heavily opinionated.

Sachs refers to others as pioneers in the field. He, of course, is one of the great pioneers. When such experience is coupled with an account of that experience that is self-critical, honest and thoroughly biased in the direction that the author believes points toward the truth, the neurological surgeon has something that is worth ten of the flossier, immaculately illustrated and evasive texts.

MEDICAL JURISPRUDENCE

Unauthorized Treatment—Scope of Consent

PEART, BARATY & HASSARD OF THE CALIFORNIA BAR

In Wheeler v. Barker, 92 ACA 915 (July 11, 1949) the California District Court of Appeals was presented with the following facts:

Mrs. P. was being treated by Dr. D. for continued vaginal bleeding. In January 1946, Dr. D. upon making a pelvic examination had found what appeared to be a small fibroid tumor on the anterior surface of the uterus. In succeeding months other examinations by Dr. D. revealed the mass in the right ovarian region at first to be about half as large as a walnut which grew to the size of a lemon. During July 1946 Mrs. P. consulted physicians in Santa Barbara. One diagnosed her symptom as an ovarian cyst and the other as a growth on the uterus. Both recommended immediate surgery. Mrs. P. told Dr. D. of these examinations and recommendations. On August 1, 1946, Mrs. P. was again examined by Dr. D. and he again advised surgery.

Mrs. P. testified that she consented only to the removal of the right ovary and nothing more. Defendant and his nurse testified that he told plaintiff it might be necessary to remove the right ovary or the uterus, depending on the condition found when her abdomen had been opened, and that he promised not to remove both ovaries, which was the only limitation requested by plaintiff.

On August 4, 1946, Mrs. P. went to a hospital in Ventura where she signed a consent to "whatever anesthetic and operation which may be decided to be necessary or advisable." A registered nurse signed as a witness.

On August 5, 1946, Dr. D., assisted by another physician, performed the operation. Upon making the opening in plaintiff's abdomen they found the ovaries were not diseased but the mass which had been felt on examination was a large tumor attached to the uterus, adjacent to the right ovary, and that the uterine wall was filled with multiple fibroid tumors. The surgeons consulted about the condition found and agreed that a subtotal hysterectomy was necessary and proceeded with that operation. Upon its completion plaintiff's husband was told what had been done and when the effects of the anesthetic had subsided plaintiff was likewise told what had been removed. Neither of them expressed any dissatisfaction. The postoperative course was normal. The first difficulty between the parties arose when Dr. D. refused to give Mrs. P. sleeping pills. She became angry and ceased to be Dr. D.'s patient. Thereafter Mrs. P. brought an action against Dr. D. to recover damages for technical assault and battery on the ground that Dr. D. had performed an alleged unauthorized operation on Mrs. P. In the trial before a jury a verdict was rendered in favor of Dr. D. and the verdict and judgment were affirmed on appeal by the District Court of Appeal.

Dr. D., his assistant surgeon and another local physician all testified that the operation was necessary in accordance with the standards of practice in the community to preserve Mrs. P.'s health, and that the bleeding would have continued had the uterus not been removed. There was evidence that Mrs. P.'s condition of health might have become worse, that the bleeding would have continued, and that the tumor might have become malignant.

In its decision affirming the verdict of the jury, the court held that the purpose of the operation was to stop the vaginal bleeding that had continued for several months and remove the growth on the female organs. "It was defendant's duty to do whatever was necessary to effect a cure. In exercising his best judgment as to what was the proper course to pursue he was performing a professional service for which he had been employed. When a surgeon is confronted with an emergency or an unanticipated condition and immediate action is necessary for the preservation of the life or health of the patient and it is impracticable to obtain consent to an operation which he deems to be immediately necessary, it is his duty to do what the occasion demands within the usual and customary practice among physicians and surgeons in the same or similar localities, and he is justified in extending the operation and in removing and overcoming the condition without the express consent of the patient."

By the signed consent Mrs. P. agreed to whatever operation was decided to be necessary or advisable. This instrument furnished the basis for the admission of evidence that a necessity existed for the removal of two-thirds of Mrs. P.'s uterus and that it was necessary for Dr. D. and his assisting surgeon to make an emergency decision upon discovery of its condition. Mrs. P. contended that although an emergency may have existed, the removal of her uterus was not necessary at that time. The court held that Dr. D. was justified in the extent of his operation because the existence of a large fibroid tumor on the uterus and multiple tumors and nodules on the inner walls constituted an emergency which required the surgeons, in the light of their experience, to determine at once whether the removal of the diseased portion was necessary for the preservation of Mrs. P.'s health. The court further stated that "defendant doctor would have been subject to grave censure had he closed the incision and awaited plaintiff's recovery from the effects of the anesthetic in order to have further consultation with her concerning the removal of the alien material."

In these circumstances the District Court of Appeal held that Dr. D. was confronted with a necessity and emergency and that preservation of the health of Mrs. P. depended upon the removal of the foreign growth, together with that portion of the uterus to which it was attached, at the time of the operation.

PROGRAM AND PRE-CONVENTION REPORTS

for the

CALIFORNIA MEDICAL ASSOCIATION

Seventy-ninth Annual Session

San Diego, April 29—May 3, 1950

Balboa Park

* * *

INDEX

Page
Photographs of Guest Speakers 266
Photographs of Officers 268
Officers and Delegates 269
House of Delegates Agenda 271
Scientific Meetings:
  General Meetings 273
  Section on General Medicine 274
  Section on General Surgery 275
  Section on General Practice 277
  Section on Allergy 278
  Section on Anesthesiology 279
  Section on Dermatology and Syphilology 280
  Section on Eye, Ear, Nose and Throat 282
  Section on Industrial Medicine and Surgery 283
  Section on Psychiatry and Neurology 287
  Section on Obstetrics and Gynecology 284
  Section on Pathology and Bacteriology 285
  Section on Pediatrics 286
  Section on Public Health 288
  Section on Radiology 289
  Section on Urology 290
Scientific Exhibits 291
Medical Motion Pictures 292
Index to Speakers 294
Chart of Meeting Times and Places 297
Woman's Auxiliary to C.M.A. 298

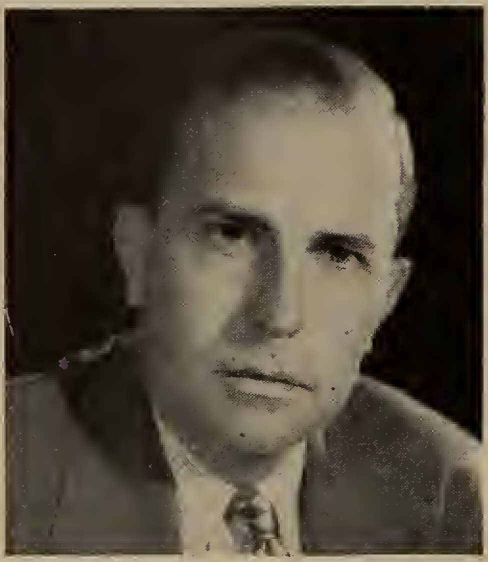
* * *

PRE-CONVENTION REPORTS

Page
Reports of General Officers 307
Reports of District Councilors 317
Reports of Councilors-at-Large 319
Reports of Committees 320
Reports of County Medical Societies 328

Cancer Commission Pre-Convention Conferences, Page 296

Guest Speakers



FRANKLIN D. MURPHY

JEROME W. CONN

WARREN H. COLE

R. GORDON DOUGLAS

E. T. BELL

Guest Speakers

FRANKLIN D. MURPHY, Kansas City, Kansas—Dean, University of Kansas School of Medicine.

JEROME W. CONN, Ann Arbor, Michigan—Associate Professor of Internal Medicine, Chief, Division of Metabolism and Endocrinology. University of Michigan Medical School.

WARREN H. COLE, Chicago, Illinois—Professor of Surgery and Head of Department of Surgery, University of Chicago School of Medicine.

R. GORDON DOUGLAS, New York, New York—Professor of Obstetrics and Gynecology, Cornell University Medical College.

E. T. BELL, Minneapolis, Minnesota—Professor of Pathology, University of Minnesota Medical School.

R. STANLEY KNEESHAW
President

DONALD CASS
President-Elect

OFFICERS AND DELEGATES

General Officers

R. Stanley Kneeshaw, San Jose, President
Donald Cass, Los Angeles, President-Elect
L. A. Alesen, Los Angeles, Speaker of House of Delegates
Donald A. Charnock, Los Angeles, Vice-Speaker of House of Delegates
Sidney J. Shipman, San Francisco, Chairman of Council
L. Henry Garland, San Francisco, Secretary
Dwight L. Wilbur, San Francisco, Editor
John Hunton, San Francisco, Executive Secretary
Peart, Baraty & Hassard, Legal Counsel

Members of House of Delegates — 47th Annual Session

TOTAL DELEGATES (240)

DELEGATES EX OFFICIO (21)

R. Stanley Kneeshaw, San Jose	President
Donald Cass, Los Angeles	President-Elect
L. A. Alesen, Los Angeles	Speaker of House of Delegates
Donald A. Charnock, Los Angeles	Vice-Speaker of House of Delegates
L. Henry Garland, San Francisco	Secretary-Treasurer
Dwight L. Wilbur, San Francisco	Editor
John D. Ball (1950)	Councilor 1st District
Jay J. Crane (1951)	Councilor 2nd District
Harry E. Henderson (1952)	Councilor 3rd District
Axcel E. Anderson (1950)	Councilor 4th District
Hartzell H. Ray (1951)	Councilor 5th District
M. Laurence Montgomery (1952)	Councilor 6th District
Donald D. Lum (1950)	Councilor 7th District
Wayne E. Pollock (1951)	Councilor 8th District
John W. Green (1952)	Councilor 9th District
Sidney J. Shipman (1950)	Councilor-at-Large
Wilbur Bailey (1950)	Councilor-at-Large
Francis E. West (1951)	Councilor-at-Large
H. Gordon MacLean (1951)	Councilor-at-Large
Benjamin Frees (1952)	Councilor-at-Large
C. V. Thompson (1952)	Councilor-at-Large

ELECTED DELEGATES (219)

Delegates	*Alternates*
Alameda County (16)	
Dorothy M. Allen	John Bartlett
Cyril J. Attwood	L. E. Brown
K. W. Benson	A. B. Carson
John Blum	R. Abbott Crum
H. Chesley Bush	W. D. Desch
William G. Donald	Grant Ellis
James B. Graeser	Homer Fornoff
James T. Harkness	Elmo M. Grimmer
Ernest W. Henderson	Samuel P. Hall
Arthur J. Hunnicutt	William Marsh
Lloyd Kindall	Thomas T. Nickels
Lester Lawrence	Robert S. Peers
Paul P. Michael	Paul C. Samson
James Raphael	Victor E. Sbarbaro
T. E. Reynolds	P. R. Shumaker
Stanley R. Truman	Richard A. Young
Butte-Glenn County (2)	
Hollis L. Carey	Darius F. Caffaratti
C. Meredith Guernsey	C. K. Hubbard
Contra Costa County (3)	
Kaho Daily	Howard B. Flanders
Clifford L. Feiler	Bernard B. Gadwood
L. H. Fraser	Paul H. Ryan
Fresno County (5)	
Neil J. Dau	Thomas A. Collins
E. C. Halley	Otto Diederich
Henry A. Randel	F. Harold Downing
Eliot Sorsky	W. H. Gilliatt
J. E. Young	George W. Olson
Humboldt County (1)	
O. R. Myers	Harry L. Jenkins
Imperial County (1)	
George C. Holleran	Ernest Brock
Inyo-Mono County (1)	
C. L. Scott	
Kern County (3)	
Sophie L. Goldman	S. G. Kearney
Chester I. Mead	Raymond Owens
Roderick A. Ogden	J. E. Vaughan
Kings County (1)	
William F. Chamlee	W. L. Dittes
Lassen-Plumas-Modoc County (1)	
J. D. Coulter	
Los Angeles County (86)	
Marden A. Alsberge	Jack K. Afflerbaugh
E. R. V. Anderson	Chester Alcorn
A. J. Annis	E. W. Alsberge
E. Vincent Askey	Elmer L. Anderson
Elmer J. Ball	John Martin Askey
A. Elmer Belt	Franklin I. Ball
B. J. Bergstrom	Terry C. Bennett
John W. Beswick	Frederick A. Bennetts
Robert L. Blackmun	John E. Bergmann
George E. Brown	Frederic K. Bergstrom
Richard O. Bullis	Clarence J. Berne
L. C. Burwell	Edward W. Boland
Ralph V. Byrne	Albert G. Bower
George W. Caldwell	Edwin F. Boyd, Sr.
Wells C. Cook	Kenneth H. Boyer
Clair P. Cosgrove	Fred E. Bradford
Jay B. Cosgrove	Kenneth C. Brandenburg
William E. Costolow	James L. Bray
Charles H. Cowgill	H. B. Breitman
Lyle G. Craig	Lyman A. Brewer
Frank G. Crandall, Jr.	John R. Brophy
Lawrence L. Craven	John W. Budd
Philip J. Cunnane	John A. Bullis
Douglas Donath	Tenero D. Caruso
G. R. Dunlevy	John L. Caster
Frederic Ewens	Rafe C. Chaffin
Ward L. Fisher	Finis G. Cooper
Paul D. Foster	Burr Dalton
F. J. Gaspard	John S. Darby
Charles W. Gilfillan	John H. Davis
Victor Goodhill	Kenneth S. Davis
Richard A. Griffin	M. A. Desmond
John B. Hamilton	J. James Duffy
J. Severy Hibben	Milo Ellik
Lawrence M. Hill	Homer S. Elmquist
Elizabeth Mason Hohl	Charles V. Emerson
Eugene F. Hoffman	Alvin G. Foord
Robert B. Hope	Percy A. Foster
Howard P. House	Charles A. Foulks
Harry H. Jacob	Garland F. Garrett
Ludwig L. Kaftan	Glenn G. Graham
Arthur A. Kirchner	William H. Grishaw
T. J. Laughlin	Frederick G. Gruber
William H. Leake	Francis E. Guinney
Thomas A. LeValley	Ernest M. Hall
H. Clifford Loos	Paul M. Hamilton
J. Lafe Ludwig	Thomas M. Hearn

Delegates	*Alternates*
Douglas R. MacColl	Walter M. Holleran
L. Duke Mahannah	John Hromadka
John B. Marr	Leland G. Hunnicutt
Paul E. McMaster	Arthur H. Hurd
Robert W. Meals	Willis L. Jacobus, Jr.
William R. Molony, Sr.	Glen Ellis Jones
James J. Morrow	Theodore S. Kimball
Carl L. Mulfinger	Carl E. Krugmeier
J. C. Negley	E. R. Lambertson
M. L. Newkirk	Robert W. Langley
Edward F. Nippert	W. E. Macpherson
Joseph P. O'Connor	Ben D. Massey
J. Norman O'Neill	W. O. McDermott
Frank W. Otto	M. W. McDougall
John R. Paxton	Arthur J. Mendenhall
Milton M. Portis	Oliver M. Moore
James F. Regan	A. D. Myers
E. T. Remmen	Clarence H. Nelson
J. M. de los Reyes	Ross V. Parks
Edward C. Rosenow, Jr.	Emmet A. Pearson
John C. Ruddock	Hubert J. Prichard
Carl F. Rusche	William F. Quinn
J. P. Sampson	Paul A. Reichle
Frank F. Schade	Gordon L. Richardson
Walter Scott	Henry P. Rover
J. Edward Short	Frederick C. Schlumberger
Ralph Varian Sloan	Paul F. Seitter
Ralph T. Smith	Hollis E. Sides
Buell H. Sprague	William H. Snyder
Justin J. Stein	Norman F. Sprague, Jr.
Robert Leo Stern	Delbert L. Stokesbary
Leonard Stovall	Ewing L. Turner
Clinton H. Thienes	Joseph A. Walshe
Walter Wessels	E. Richmond Ware
Allan B. Wilkinson	John W. Whitsett
Warren A. Wilson	Louis F. X. Wilhelm
Harold R. Witherbee	Daniel L. Woods
John H. Woodruff, Jr.	John M. Wright
Henry Marcus Young	William K. Zimmermann

Marin County (2)

Carl W. Clark	Warren Bostick
Alfred J. Schwarz	George Landrock

Mendocino-Lake County (1)

E. C. Bennett	Clemens M. Beil

Merced County (1)

George Pimentel	E. A. Jackson

Monterey County (2)

S. Condit Glasgow	Howard E. Clark
J. B. McCarthy	Howard C. Miles

Napa County (1)

Dwight H. Murray	Harry Baker

Orange County (5)

A. Norton Donaldson	Lester L. Blount
Charles E. Irvin	Harold F. Galbraith
Russell Johnson	Milton M. Maxwell
G. Wendell Olson	Harold Neslund
J. B. Price	Ralph E. White

Placer-Nevada-Sierra County (1)

William M. Miller	Harry March

Riverside County (3)

H. M. F. Behneman	Cecil Baisinger
Franklin B. Mead	Robert Merrill
Frederick A. Veitch	Elmer Olson

Sacramento County (5)

Orrin Cook	George Chappell
Dave F. Dozier	Herbert Jenkins
Dudley Saeltzer	Dan O. Kilroy
Ralph Teall	John B. Long
James H. Yant	Frank A. MacDonald

San Benito County (1)

Roswell L. Hull	John J. Haruff

San Bernardino County (5)

Meredith G. Beaver	James C. Carmack
Carl M. Hadley	John H. Coughlin
J. Needham Martin	Frank C. Melone
E. L. Tisinger	Philip M. Savage, Jr.
Arthur E. Varden	Thomas I. Zirkle

San Diego County (10)

Douglass H. Batten	H. G. Holder
William C. Black	James I. Knott
E. A. Blondin	Joseph M. Maguire
Roger Isenhour	Arthur A. Marlow
Francis E. Jacobs	Willard H. Newman
A. E. Moore	J. G. Omelvena
Hiram D. Newton	James W. Ravenscroft
R. J. Prentiss	Frank H. Robinson
Clarence E. Rees	J. T. Wells
Wesley S. Smith	

San Francisco County (27)

Delegates	*Alternates*
Walter Beckh	Joseph Auerbach
H. Glenn Bell	Jerome W. Bettman
William L. Bender	Donald M. Campbell
Walter Birnbaum	Lawrence R. Custer
Gerson R. Biskind	Gerald Feigen
Lois Brock	William P. Forcade
William G. Burkhard	Claudius Y. Gates
Donald A. Carson	Berthel H. Henning
Chester L. Cooley	Francis T. Hodges
Martin W. Debenham	Alvin H. Jacobs
Anthony B. Diepenbrock	E. Donald Lastreto
William T. Duggan	Charles W. Leach
Roberto Escamilla	Harold H. Lindner
Henry L. Gardner	Mary E. Mathes
Frank L. A. Gerbode	James J. McGinnis
Henry Gibbons, III	Edmund J. Morrissey
Ivan C. Heron	Wesley E. Scott
Allen T. Hinman	Ralph Scovel
Alson R. Kilgore	Samuel R. Sherman
Carleton Mathewson, Jr.	Abraham B. Sirbu
Joseph S. McGuinness	Grace M. Talbott
Mary B. Olney	Emile D. Torre
Leon O. Parker	William W. Washburn
Francis Rochex	Forrest M. Willett
Robert A. Scarborough	A. Justin Williams
Donald R. Smith	Reuben Zumwalt
Robertson Ward	

San Joaquin County (3)

J. Frank Doughty	Louis P. Armanino
Jack Eccleston	Frank A. McGuire
Neill Johnson	Rudolph B. Toller

San Luis Obispo County (1)

Robert O. Pearman	Richard T. Treadwell

San Mateo County (4)

Thomas E. Farthing	C. D. Benninghoven
Stuart Lindsay	D. W. Boudett
A. G. Miller	Logan Gray
Meade Mohun	R. F. McLaughlin

Santa Barbara County (3)

J. Gary Campbell	Max Hammel
A. E. Wentz	R. W. Lambuth
Alfred B. Wilcox	Douglas F. McDowell

Santa Clara County (7)

C. Kelly Canelo	Deane Adams
Burt Davis	Holden E. Brink
Thomas N. Foster	J. D. Lamon
Leon P. Fox	Thomas Lyon
J. B. Josephson	Paul V. Morton
Leslie B. Magoon	Sydney F. Thomas
James C. Muir	Leo L. Wilson

Santa Cruz County (2)

Luther Newhall	
Samuel B. Randall	

Shasta County (1)

Siskiyou County (1)

James B. McGuire	C. C. Dickinson

Solano County (2)

F. Burton Jones	Matthew Gibbons
Carlton C. Purviance	Bernard V. O'Donnell

Sonoma County (2)

Alexis G. Maximov	William N. Makaroff
Roscoe L. Zieber	John J. Mohrman

Stanislaus County (2)

John Czatt	John Cooper
R. Stewart Hiatt	Edward J. Denenholz

Tehama County (1)

James L. Faulkner	R. G. Frey

Tulare County (2)

W. B. Parkinson	J. H. Brady
Wiley C. Zink	Frank Wiens

Ventura County (2)

J. W. Moore	W. Cloyce Huff
A. A. Morrison	J. R. Monahan

Yolo County (1)

John Homer Woolsey	Ray E. Nichols

Yuba-Sutter-Colusa County (1)

Stanley R. Parkinson	Walter J. Schmidt

House of Delegates Agenda

1950 Annual Session

(47th Annual Session)
Ball Room, Hotel del Coronado

Speaker, L. A. Alesen, *Los Angeles*
Vice-Speaker, Donald Charnock, *Los Angeles*
Secretary, L. Henry Garland, *San Francisco*

FIRST MEETING

Sunday, April 30, 1950, at 5:00 p.m.

Order of Business

1. Call to order.
2. Report of Committee on Credentials, and Organization of the House of Delegates.
3. Roll call.
4. Announcement and approval of Reference Committees.
   - *(a)* Committee on Credentials. (Delegates must register with the Committee.)
   - *(b)* Reference Committee on the Reports of Officers, the Council and Standing and Special Committees. (Reference Committee No. 1.)
   - *(c)* Reference Committee on Finance, to review the reports of the Secretary-Treasurer and the Executive Secretary and to study and make recommendations to the House of Delegates on the budget submitted by the Council and the amount of dues for the ensuing year. (Reference Committee No. 2.)
   - *(d)* Reference Committee on Resolutions, Amendments to the Constitution and By-Laws and New and Miscellaneous Business. (Reference Committee No. 3.)
   - *(e)* Reference Committee on Executive Session, to consider business brought before the House of Delegates in Executive Session. (Reference Committee No. 4.)
5. Address by President—R. Stanley Kneeshaw. Presentation of 50-Year Awards.
6. Miscellaneous announcements by the Speaker. (Stenographic service, to secure triplicate copies of resolutions, etc.)
7. Report of the Council—Sidney J. Shipman, chairman.
8. Report of the Trustees of the California Medical Association—R. Stanley Kneeshaw, president.
9. Report of the Auditing Committee—H. Gordon MacLean, chairman.
10. Report of the Secretary—L. Henry Garland.
11. Report of the Executive Secretary—John Hunton.
12. Recess.—(At 8 o'clock the House of Delegates will recess. Elected and ex-officio members of the House will then convene under the chairmanship of the president of the Board of Trustees of California Physicians' Service, to function with Board of Administrative Members of California Physicians' Service. With the adjournment of the meeting of C.P.S. Administrative Members, the C.M.A. House of Delegates will convene, to act again as the House of Delegates of the California Medical Association.)

Meeting of Administrative Members of California Physicians' Service

1. Roll call.
2. Report of the President—Dr. Lowell S. Goin.
3. Report of the Secretary—Dr. Henry Gardner.
4. C.P.S. Administration Business Report, by the Executive Director—Mr. W. M. Bowman.
5. Appointment of Nominating Committee for Trustees and Administrative Members at Large.
6. Introduction of Resolutions.
7. Recess—for 24 hours. (Time of reconvening will be stated.) The order of business then will be:
8. Consideration of the Report of the Nominating Committee.
9. Consideration of resolutions.
10. New business.

Reconvening of House of Delegates

13. Report of the Editor—Dwight L. Wilbur.
14. Reports of District Councilors.
15. Reports of Councilors-at-Large.
16. Report of Legal Counsel—Peart, Baraty & Hassard.
17. Reports of Standing and Special Committees:
   - *A. Standing Committees:*
     - *(a)* Executive Committee—H. Gordon MacLean.
     - *(b)* Committee on Associated Societies and Technical Groups—Robert A. Scarborough.
     - *(c)* Committee on Audits—H. Gordon MacLean.
     - *(d)* Committee on Health and Public Instruction—Orrin Cook.
     - *(e)* Committee on History and Obituaries—Robert A. Peers.
     - *(f)* Committee on Hospitals, Dispensaries, and Clinics—Carroll B. Andrews.
     - *(g)* Committee on Industrial Practice—Donald Cass.
     - *(h)* Committee on Medical Defense—H. Clifford Loos.
     - *(i)* Committee on Medical Economics—H. Gordon MacLean.
     - *(j)* Committee on Medical Education and Medical Institutions—L. R. Chandler.
     - *(k)* Committee on Organization and Membership—Carl L. Mulfinger.
     - *(l)* Committee on Postgraduate Activities—John C. Ruddock.
     - *(m)* Committee on Publications—George Dawson.
     - *(n)* Committee on Public Policy and Legislation—Dwight H. Murray.
     - *(o)* Committee on Scientific Work (Annual Session)—L. Henry Garland.

(p) Cancer Commission—Lyell C. Kinney.

(q) Editorial Board—Dwight L. Wilbur.

(r) Public Relations—John Hunton.

B. Special Committees:

(a) Delegates to the American Medical Association—E. Vincent Askey.

(b) Physicians' Benevolence Committee—Axcel E. Anderson.

(c) Advisory Planning Committee—John Hunton.

(d) Blood Bank Commission—John Upton.

(e) Committee on Industrial Health—Christopher Leggo.

(f) Committee on Rural Medical Service—Carroll B. Andrews.

18. Old and Unfinished Business.

(a) Constitutional Amendments.

19. New Business.

SECOND MEETING

Tuesday, May 2, at 5:00 p.m.

ORDER OF BUSINESS

1. Call to order.
2. Supplemental Report of Credentials Committee.
3. Roll call.
4. Secretary's announcement of Council's selection of place for the 1951 annual session.
5. Election of Officers:

(a) President-Elect.

(b) Speaker.

(c) Vice-Speaker.

(d) District Councilors (three-year term):*

1. First District—John D. Ball, Santa Ana (term expiring).
First District—Imperial, Orange, Riverside, San Bernardino and San Diego counties.

2. Fourth District—Axcel E. Anderson, Fresno (term expiring).
Fourth District—Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare and Tuolumne counties.

3. Seventh District—Donald D. Lum, Alameda (term expiring).
Seventh District—Alameda and Contra Costa Counties.

(e) Councilors-at-Large (three-year term):

Sidney J. Shipman (term expiring).
Wilbur Bailey (term expiring).
Francis E. West (to fill vacancy term expiring 1951).

(f) Delegates to the American Medical Association:

Delegates are elected for two calendar years. At this session of the C.M.A. House of Delegates, terms of Delegates elected for calendar years 1951-1952 will expire on December 31, 1952.

For terms January 1, 1951, to December 31, 1952

Incumbents

(a) H. Gordon MacLean (term expiring).

(b) E. Vincent Askey (term expiring).

(c) John W. Cline (term expiring).

(d) Donald Cass (term expiring).

(e) Ralph E. Eusden, Long Beach (term expiring).

(f) Additional Delegate to A.M.A.—R. Stanley Kneeshaw incumbent through Council appointment.

(g) Alternates to American Medical Association:

(a) Leopold H. Fraser, Richmond (alternate to H. Gordon MacLean).

(b) William H. Leake, Los Angeles (alternate to E. Vincent Askey).

(c) C. Kelly Canelo, San Jose (alternate to John W. Cline).

(d) L. Duke Mahannah, Long Beach (alternate to Donald Cass).

(e) Alternate to additional Delegate to A.M.A. Russel V. Lee incumbent through Council appointment. (Alternate to R. Stanley Kneeshaw.)

6. Announcement by Secretary.
Council's nominations of members of Standing Committees. (For approval by the House of Delegates.)
7. Reports of Reference Committees:

(a) Report of Reference Committee No. 1 on Reports of Officers, the Council, and Standing and Special Committees.

(b) Report of Reference Committee No. 2 on Reports of the Secretary-Treasurer and the Executive Secretary, on budget and dues.

(c) Report of Reference Committee No. 3 on Resolutions, Amendments to the Constitution and By-Laws and New and Miscellaneous Business.

(d) Report of Reference Committee No. 4 on business brought before the House of Delegates in Executive Session.

8. Unfinished Business.
9. New Business.
10. Presentation of Officers:
President
President-Elect
Speaker
Vice-Speaker
11. Presentation of Certificate to Retiring President—R. Stanley Kneeshaw.
12. Approval of Minutes. (Committee to edit.)
13. Adjournment.

LEWIS A. ALESEN, *Speaker*
L. HENRY GARLAND, *Secretary*

**Procedure of nomination of District Councilors is outlined in paragraph 3 of Article VII, Section 1, of C.M.A. constitution, adopted on May 8, 1940:*

The nine district Councilors shall be elected as follows:

Prior to the time set for election of district Councilors, the delegates of each Councilor district for which a councilorship is about to become vacant, shall submit in writing to the Secretary-Treasurer the names of one or more nominees to fill the said vacancy.

The Secretary-Treasurer shall transmit the names of such nominee or nominees so submitted to him to the House of Delegates on or before the time set for the election.

A vote shall be taken by the House of Delegates upon the nominee or nominees so submitted and, in the event that only one nominee has been submitted, the House of Delegates may, by a majority vote, either elect or refuse to elect said nominee.

If the House of Delegates shall reject the sole nominee of the delegates from the councilorship district concerned, then said delegates must immediately thereafter submit an additional nominee or nominees and the House shall proceed to vote thereon; if there is but one nominee, the House may elect or reject.

If, after such time as the Speaker may allow, delegates within such councilor district fail to submit an additional nominee or nominees, the House of Delegates may then proceed to make nominations from the floor of the House and a vote shall then be taken by the House of Delegates to determine who shall be elected to the vacant councilorship.

All nominees for district councilorships must be members in good standing, residing within the district in which the vacancy exists.

SCIENTIFIC SESSIONS

General Meetings

FIRST GENERAL MEETING

SUNDAY, APRIL 30

10:00 – Recital Hall, Palisades Building

Chairman: R. Stanley Kneeshaw, M.D., San Jose

10:00 – **Address of Welcome**—Clarence E. Rees, M.D., President, San Diego County Medical Society.

10:05 – **Greetings from the Woman's Auxiliary**—Mrs. Raymond T. Wayland, President, Woman's Auxiliary to the California Medical Association.

10:10 – **Address of the President**—R. Stanley Kneeshaw, M.D., San Jose.

10:40 – **The Concept of Continuation Education in Medicine**—Franklin D. Murphy, M.D., Kansas City, Kansas, by invitation.

11:10 – **The Metabolic Effect of ACTH and Cortisone in Man**—Jerome W. Conn, M.D., Ann Arbor, Michigan, by invitation.

11:35 – **Intestinal Obstruction** — Warren H. Cole, M.D., Chicago, Illinois, by invitation.

SECOND GENERAL MEETING

TUESDAY, MAY 2

9:30 – Recital Hall, Palisades Building

Chairmen: Conrad J. Baumgartner, M.D., Beverly Hills, Lewis T. Bullock, M.D., Los Angeles

9:30 – **The Relation of the Kidneys to Primary Hypertension**—E. T. Bell, M.D., Minneapolis, Minnesota, by invitation.

10:00 – **Management of Hemorrhage Complicating Pregnancy and Delivery**—R. Gordon Douglas, M.D., New York, N. Y., by invitation.

10:30 – **Question and Answer Period.**

Clinical-Pathological Conference

10:45 – Case No. 1—Pathologist George Hummer, M.D., Santa Monica. Surgeon Warren H. Cole, M.D., Chicago, Illinois, by invitation. Clinician Jerome W. Conn, M.D., Ann Arbor, Michigan, by invitation.

11:30 – Case No. 2 — Pathologist Gert Ludwig Laqueur, M.D., San Francisco, by invitation. Clinician Jerome W. Conn, M.D., Ann Arbor, Michigan, by invitation.

THIRD GENERAL MEETING

WEDNESDAY, MAY 3

9:30 – Recital Hall, Palisades Building

What's New in Medicine

Chairman: Ivan C. Heron, M.D., San Francisco

9:30 – **What's New in Histopathology**—E. T. Bell, M.D., Minneapolis, Minnesota, by invitation.

9:50 – **What's New in Thyroid Surgery**—Warren H. Cole, M.D., Chicago, Illinois, by invitation.

10:10 – **What's New in Obstetrics**—R. Gordon Douglas, M.D., New York, N. Y., by invitation.

10:30 – **What's New in Medical Curricula**—Franklin D. Murphy, M.D., Kansas City, Kansas, by invitation.

10:50 – **What's New in Cardiovascular Surgery** — Frank Gerbode, M.D., San Francisco.

11:10 – **What's New in Medical Radioactive Isotopes** —Robert R. Newell, M.D., San Francisco.

11:30 – **What's New in Medical Control of Sex Deviates**—N. K. Rickles, M.D., Beverly Hills.

Questions in writing to the speakers: These will be discussed after each presentation.

Section Meetings

GENERAL MEDICINE

Lewis T. Bullock, M.D., Los Angeles, *Chairman*
DeWitt K. Burnham, M.D., San Francisco, *Secretary*
Edgar F. Mauer, M.D., Los Angeles, *Assistant Secretary*

LEWIS T. BULLOCK
Chairman, General Medicine

DEWITT K. BURNHAM
Secretary, General Medicine

SUNDAY, APRIL 30

2:00 – Recital Hall, Palisades Building

Symposium

Diseases of the Central Nervous System

Chairman: Lewis T. Bullock, M.D., Los Angeles

CURRENT THERAPY EVALUATION

2:00 – **Parkinson's Disease** — J. Ray Van Meter, M.D., Palo Alto.

2:15 – **Epilepsy**—Samuel D. Ingham, M.D., Los Angeles.

2:25 – **Meningitis**—William J. Kerr, Jr., M.D., San Rafael, by invitation, and Edward B. Shaw, M.D., San Francisco.

2:45 – **Coccidioidal Meningitis**—Robert Cohen, M.D., Bakersfield.

2:55 – **Cerebral Thrombosis and Embolism** — Karl Von Hagan, M.D., Los Angeles.

3:10 – **Myasthenia Gravis** — Robert B. Aird, M.D., San Francisco, and M. Brent Campbell, M.D., by invitation, San Francisco.

3:20 – **Subarachnoid Hemorrhage** — John B. Doyle, M.D., Los Angeles.

3:35 – **Peripheral Neuritis**—Elinor Ives, M.D., Los Los Angeles.

3:50 – **Recess.**

DIAGNOSTIC CONTRIBUTIONS

4:00 – **Cerebral Angiography**—Rupert Raney, M.D., Los Angeles.

4:25 – **Electroencephalography** — Charles Yeager, M.D., San Francisco, by invitation.

4:45 – **Electromyogram**—James Golseth, M.D., Altadena.

MONDAY, MAY 1

9:30 – Recital Hall, Palisades Building

Joint Meeting with Sections on General Surgery, General Practice, Anesthesiology and Radiology

For Program, see Section on General Surgery

TUESDAY, MAY 2

2:00 – Recital Hall, Palisades Building

Symposium

The Adrenal Cortex

2:00 – **The Metabolic Activities of the Steroid Hormones**—Ralph E. Homann, Jr., M.D., Los Angeles.

2:20 – **Adrenal Cortex Tumors: Clinical Syndromes** —E. Kost Shelton, M.D., Los Angeles.

2:45 – **The Adrenal Cortex in Fat Metabolism and Diabetes**—Eaton M. MacKay, M.D., La Jolla.

3:10 – **Intermission.**

3:15 – **Relation of the Adrenal Cortex to Immune Mechanisms** — Abraham White, Ph.D., Los Angeles, by invitation.

3:40 – **The Adrenal Cortex and the Rheumatic Diseases** — Edward W. Boland, M.D., Los Angeles.

4:05 – **Discussion of Preceding Papers**—Jerome W. Conn, M.D., Ann Arbor, Michigan, by invitation.

4:30 – **Round Table Discussion**—Questions from the floor.
Moderator: Jerome W. Conn, M.D.

GENERAL SURGERY

Conrad J. Baumgartner, M.D., Los Angeles, *Chairman*
Frank Gerbode, M.D., San Francisco, *Secretary*
William P. Longmire, Jr., M.D., Los Angeles, *Assistant Secretary*

CONRAD J. BAUMGARTNER
Chairman, General Surgery

FRANK GERBODE
Secretary, General Surgery

SUNDAY, APRIL 30

2:00 – Room 13, Conference Building

2:00 – **Chairman's Address: Lateral Cysts and Fistulas of the Neck**—Conrad J. Baumgartner, M.D., Beverly Hills.

Discussion.

2:20 – **Surgery of the Parotid Gland** — Donald E. Ross, M.D., Los Angeles.

Discussion.

2:40 – **Pre- and Postoperative Care of Acute Arterial Obstruction**—Norman E. Freeman, M.D., and Rutherford S. Gilfillan, M.D., by invitation, San Francisco.

Discussion.

3:00 – **Cross Transfusion: A Method for the Continuous Exchange of Large Volumes of Blood Between Donor and Patient**—Peter F. Salisbury, M.D., Los Angeles.

Discussion.

3:20 – **Hashimoto's Disease or Struma Lymphomatosa**—C. Y. Gates, M.D., Paul Walstad, M.D., and Everett Carlson, M.D., San Francisco.

Discussion.

3:40 – **Early Ambulation in Elective Surgical Cases**—Albert G. Clark, M.D., San Francisco.

Discussion.

MONDAY, MAY 1

9:30 – Recital Hall, Palisades Building

Joint Meeting with Sections on General Medicine, General Practice, Anesthesiology, and Radiology

Warren H. Cole, M.D., Moderator
Jerome W. Conn, M.D., Medical Specialist Consultant
William Bender, M.D., Internal Medicine Consultant
Ivan Heron, M.D., General Practice Consultant
William Hokr, M.D., Anesthesiological Consultant
L. Henry Garland, M.D., Radiological Consultant

9:30 – **The Management of Diabetes Through Surgery** — Jerome W. Conn, M.D., Ann Arbor, Michigan, by invitation.

Discussion.

10:00 – **Gastric Resection: Preoperative and Postoperative Care**—Orville F. Grimes, M.D., and H. Glenn Bell, M.D., San Francisco.

Discussion.

10:30 – **Considerations of Postoperative Electrolyte and Fluid Replacement**—Frederic P. Shidler, M.D., Menlo Park.

Discussion.

11:00 – **Prevention of Postoperative Pulmonary Complications: The Anesthetist's Role**—Richard C. Thompson, M.D., San Francisco.

Discussion.

11:30 – **The Use of Blood and Blood Products in the Care of the Operative Patient** — Arthur C. Pattison, M.D., Pasadena.

Discussion.

12:00 – **Recess**: Annual Meeting of California Society of Internal Medicine.

TUESDAY, MAY 2

2:00 – Puppet Theatre, Palisades Building

2:00 – **The Treatment of Portal Hypertension and Its Complications**—William P. Longmire, Jr., M.D., Los Angeles.
Discussion.

2:20 – **Amino Acid Tolerance in Experimental Portacaval Anastomosis**—Harold A. Harper, Ph.D., by invitation; Richard E. Gardner, M.D., by invitation; Robert Johansen, M.D., by invitation; Maurice Galente, M.D., by invitation; and H. J. McCorkle, M.D., San Francisco.
Discussion.

2:40 – **Obstructive Jaundice**—Warren H. Cole, M.D., Chicago, Illinois, by invitation.
Discussion.

3:00 – **The Problem of Prognosis in Pancreatitis**—J. Minton Meherin, M.D., San Francisco.
Discussion.

3:20 – **Inguinal Hernia in Men Over Sixty** — Martin W. Debenham, M.D., and Cooper Davis, M.D., by invitation, San Francisco.
Discussion.

3:40 – **Conversion of the Gallbladder to the Function of Common Duct**—Vance M. Strange, M.D., San Francisco.
Discussion.

4:00 – **Local Recurrence Following Surgery for Cancer of the Breast** — E. W. Demaree, M.D., Pasadena.
Discussion.

WEDNESDAY, MAY 3

2:00 – Puppet Theatre, Palisades Building

2:00 – **Results in the Management of Gastric Carcinoma at Stanford Hospitals: A Summary of 30 Years' Experience**—John L. Wilson, M.D., San Francisco, by invitation.
Discussion.

2:20 – **Comparative Concurrent Results Following Gastric Resection, Vagotomy, Gastroenterostomy with Vagotomy, and Hemigastrectomy with Subtotal Vagotomy**—G. Arnold Stevens, M.D., Beverly Hills.
Discussion.

2:40 – **Hypertrophic Pyloric Stenosis in Adults** — Maurice J. Brown, M.D., San Diego.
Discussion.

3:00 – **Upper Intestinal Obstruction in the Newborn** —Harry E. Peters, Jr., M.D., Oakland.
Discussion.

3:20 – **Repair of Ruptured Omphalocele**—L. Parry Douglass, M.D., San Francisco; and Glenn F. Cushman, M.D., San Francisco.
Discussion.

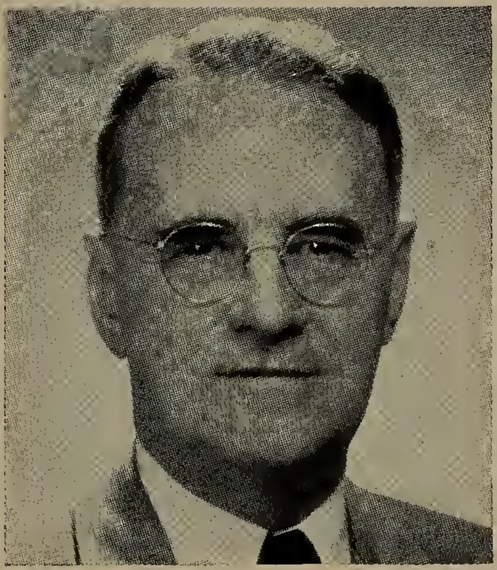
3:40 – **Repair of Hiatus Hernia of the Diaphragm by the Supradiaphragmatic Approach** — J. Norman O'Neill, M.D., Los Angeles.
Discussion.

4:00 – **The Acute Abdomen in the Aged**—George C. Henegar, M.D., Oakland, by invitation.
Discussion.

* * *

GENERAL PRACTICE

Ivan C. Heron, M.D., San Francisco, *Chairman*
James E. Reeves, M.D., San Diego, *Secretary*
John B. Long, M.D., Sacramento, *Assistant Secretary*



IVAN C. HERON
Chairman, General Practice

JAMES E. REEVES
Secretary, General Practice

SUNDAY, APRIL 30

2:00 – Puppet Theatre, Palisades Building

Joint Meeting with Sections on Allergy and Pediatrics

For Program, see Section on Allergy

MONDAY, MAY 1

9:30 – Recital Hall, Palisades Building

Joint Meeting with Sections on General Medicine, General Surgery, Anesthesiology and Radiology

For Program, see Section on General Surgery

TUESDAY, MAY 2

2:00 – Puppet Theatre, Palisades Building

2:00 – **Scrotal Swellings**—Glen H. Gummess, M.D., Los Angeles.

2:25 – **Radiation Therapy** — Herbert Hughes, M.D., San Diego.

2:50 – **Treatment of Infertility**—Edward T. Tyler, M.D., Los Angeles.

3:15 – **Use and Abuse of Anti-Thyroid Drugs**—Donald Petit, M.D., Pasadena.

3:40 – **Chairman's Address** — Ivan C. Heron, M.D., San Francisco.

4:05 – **Recess**—Business Meeting and Election of Officers.

SECTION ON ALLERGY

Albert H. Rowe, M.D., Oakland, *Chairman*
Frank G. Crandall, Jr., M.D., Los Angeles, *Vice-Chairman*
Samuel H. Hurwitz, M.D., San Francisco, *Secretary*

ALBERT H. ROWE
Chairman, Allergy

SAMUEL H. HURWITZ
Secretary, Allergy

SUNDAY, APRIL 30

2:00 – Puppet Theatre, Palisades Building

Joint Meeting with the Sections on Pediatrics and General Practice

2:00 – **Prophylaxis of Infectious Asthma** — Charles H. Pettet, M.D., Los Angeles.

2:30 – **Atopic Dermatitis—Its Etiology and Clinical Management**—Louis Tuft, M.D., Philadelphia, Pa., by invitation.

3:30 – **Asthma in Children—Problems in Diagnosis**—Carl Mauser, M.D., Oakland.

4:30 – **The Use of Raw Foods as Skin Testing Material in Allergic Disorders**—G. R. Ancona, M.D., and I. W. Schumacher, M.D., San Francisco.

MONDAY, MAY 1

9:30 – Room 8, Conference Building

9:30 – **The Role of Allergy in Epilepsy**—Charles C. Coghlan, M.D., Los Angeles.

10:00 – **Problems of the Geriatric Asthmatic and Their Clinical Management** — Louis Tuft, M.D., Philadelphia, Pa., by invitation.

10:45 – **Atopic Dermatitis in Infants and Children**—Albert Rowe, Jr., Oakland.

11:10 – **The Use of Sorlate Emulsifier and Unsaturated Fats in the Dietary Management of Chronic Atopic Eczema**—W. R. MacLaren, M.D., Pasadena.

11:30 – **Seasonal Influences on Clinical Food Allergy**—E. Gale Whiting, M.D., Berkeley.

12:00 – **Business Meeting.**

ANESTHESIOLOGY

Francis E. Guinney, M.D., Los Angeles, *Chairman*
Douglass H. Batten, M.D., San Diego, *Secretary*

FRANCIS E. GUINNEY
Chairman, Anesthesiology

DOUGLASS H. BATTEN
Secretary, Anesthesiology

SUNDAY, APRIL 30

2:00 – Room 5, Conference Building

2:00 – **Chairman's Address: Headaches Following Spinal Anesthesia for Vaginal Deliveries**—Francis E. Guinney, M.D., Los Angeles.

2:30 – **Citrate Tolerance**—Glenn Marshall, M.D., San Diego, by invitation.

Discussion by John Steelquist, M.D., San Diego.

3:00 – **The Vasoconstrictors in Spinal Anesthesia—A Review** — Douglass H. Batten, M.D., San Diego.

Discussion by Gordon C. Langsdorf, M.D., San Diego.

3:30 – **The Establishment and Operation of a Nerve Block Clinic—A Report of a Year's Experience at the Los Angeles County General Hospital**—Judson Samuel Denson, M.D., Los Angeles.

Discussion by Charles F. McCuskey, M.D., Los Angeles.

4:00 – **A Modified Technique of General Anesthesia for Laryngectomy** — Benjamin I. Schneiderman, M.D., Los Angeles.

Discussion by Samuel L. Perzik, M.D., Beverly Hills.

MONDAY, MAY 1

9:30 – Recital Hall, Palisades Building

Joint Meeting with Sections on General Medicine, General Surgery, General Practice and Radiology

For Program, see Section on General Surgery

TUESDAY, MAY 2

2:00 – Room 5, Conference Building

2:00 – **Intravenous Procaine Anesthesia**—Ernest A. Doud, M.D., San Diego.

Discussion by Harold B. Miles, M.D., Santa Barbara.

2:30 – **Economics of Anesthesia**—Thomas W. McIntosh, M.D., Pasadena.

Discussion.

3:00 – **The Teaching of Anesthesiology**—Nevin H. Rupp, M.D., Los Angeles.

Discussion by Ernest H. Warnock, M.D., San Marino.

3:30 – **Some Clinical Experiences with the Use of Tolserol as a Relaxing Agent in the Treatment of Tetanus**—Harold E. Godman, M.D., San Diego, by invitation.

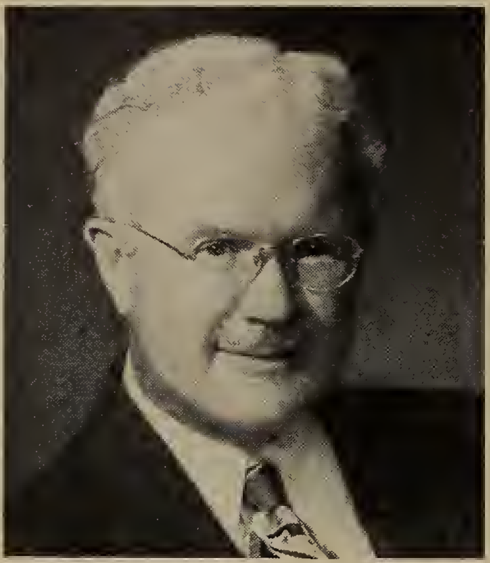
Discussion by John Howard, M.D., San Diego.

4:00 – **Recess.**

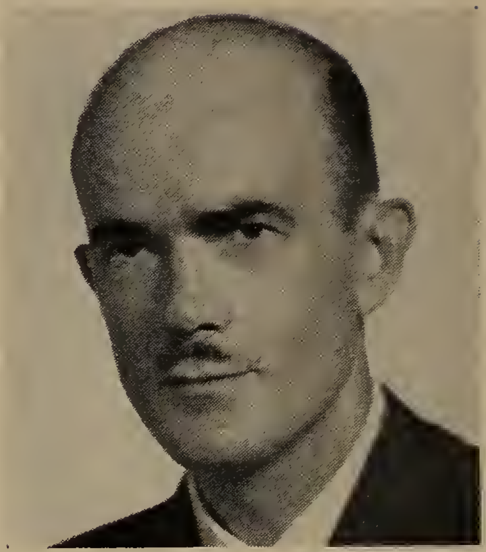
4:30 – **Business Meeting and Election of Officers.**

DERMATOLOGY AND SYPHILOLOGY

A. Fletcher Hall, M.D., Santa Monica, *Chairman*
Paul Fasal, M.D., San Francisco, *Vice-Chairman*
J. Walter Wilson, M.D., Los Angeles, *Secretary*
Richard O. Pfaff, M.D., San Jose, *Assistant Secretary*



A. FLETCHER HALL
Chairman
Dermatology and Syphilology



J. WALTER WILSON
Secretary
Dermatology and Syphilology

SUNDAY, APRIL 30

2:00 – Room 11, Conference Building

Symposium

Focal Infection in Relation to Dermatology

Moderator: Samuel Ayres, Jr., M.D., Los Angeles

2:00 – **Definition of the Problem**—Dr. Ayres.

DERMATOLOGIC ASPECTS

2:05 – **Infections of the Ear, Nose and Throat**—Herman Semenov, M.D., Beverly Hills.

2:20 – **Infections of Genito-Urinary Tract**—Chester H. Mackay, M.D., Hollywood.

2:35 – **Infections of the Gastrointestinal Tract and Lungs**—Russel V. Lee, M.D., Palo Alto.

2:50 – **Infections of the Anorectal Area**—George C. Tyler, M.D., Los Angeles.

3:05 – **Infections of Dental Origin**—J. C. A. Harding, D.D.S., San Diego, by invitation.

3:20 – **Gynecologic Infections**—Lois H. Brock, M.D., San Francisco.

3:35 – **Interpretation of Laboratory Tests in Relation to Focal Infection**—Leon J. Tragerman, M.D., Los Angeles.

* * *

4:00 – **The Development of Basal Cell Carcinoma as a Consequence of Radiodermatitis** — Nelson Paul Anderson, M.D., Los Angeles, and Harold Anderson, M.D., Long Beach.

Discussion by Charles W. McNitt, M.D., Reno, Nevada, by invitation, and Frances A. Torrey, M.D., San Francisco.

4:30 – **The Tolerance of Hairy Regions to X-Ray Therapy** — Walter F. Schwartz, M.D., Pasadena, and Robert Bruce, M.D., by invitation, Pasadena.

Discussion by Lawrence M. Nelson, M.D., Santa Barbara.

MONDAY, MAY 1

9:30 – Room 11, Conference Building

9:30 – **Rosacea in Relation to Liver Malfunction and Estrogen Metabolism** — Robert O. Lofgren, M.D., San Francisco.

Discussion by Rees B. Rees, M.D., San Francisco.

10:00 – **Kaposi's Multiple Hemorrhagic Sarcomas**—Roger Burkhart, M.D., San Jose.

Discussion by Ben A. Newman, M.D., Los Angeles, and Gordon MacDonald, M.D., Riverside.

10:30 – **Cutaneous Tuberculosis Treated by Locally Injected Streptomycin**—Paul D. Foster, M.D., Los Angeles.

Discussion by Arne Ingels, M.D., San Francisco.

11:00 – **Questions and Answers on Dermatologic Therapy** — Moderator: Hiram D. Newton, M.D., San Diego.

Panel composed of Philip K. Allen, M.D., San Diego; C. W. Barnett, M.D., San Francisco; Norman Epstein, M.D., San Francisco; W. H. Goeckerman, M.D., Los Angeles; Gage Helms, M.D., Long Beach; Ben A. Newman, M.D., Los Angeles; M. E. Obermayer, M.D., Los Angeles; Otto Schmidt, M.D., Palo Alto.

TUESDAY, MAY 2

2:00 – Room 11, Conference Building

2:00 – **Laboratory Measurement of Antihistaminic Activity of Pyribenzamine Administered by Various Routes**—Paul LeVan, M.D., Thomas H. Sternberg, M.D., and Daniel J. Perry, M.D., Los Angeles.

Discussion by Molleurus Couperus, M.D., Los Angeles.

2:30 – **Chairman's Address: The Treatment of Senile Keratoses with Podophyllin** — A. Fletcher Hall, M.D., Santa Monica.

3:00 – **Nodose Lesions of the Lower Extremities**—Louis H. Winer, M.D., Beverly Hills.

Discussion by Eugene Farber, M.D., San Francisco.

3:30 – **Therapeutic Perspective in Dermatology**—Jud R. Scholtz, M.D., Pasadena.

Discussion by W. H. Goeckerman, M.D., Los Angeles.

4:00 – **Business Meeting and Election of Officers.**

~

EYE, EAR, NOSE AND THROAT

Russell Fletcher, M.D., Berkeley, *Chairman*
George F. Keiper, M.D., Visalia, *Secretary*
Maurice W. Nugent, M.D., Los Angeles, *Assistant Secretary*

RUSSELL FLETCHER
Chairman
Eye, Ear, Nose and Throat

GEORGE F. KEIPER, JR.
Secretary
Eye, Ear, Nose and Throat

TUESDAY, MAY 2

1:30 – Room 8, Conference Building

1:30 – **The Use of the Eresiphake in Cataract Extraction**—Harold B. Alexander, M.D., Pasadena.

Discussion by Maurice W. Nugent, M.D., Los Angeles.

2:00 – **Myopia and Central Vision After 25 Years**—Lloyd Mills, M.D., Los Angeles.

Discussion.

2:30 – **The Cinch Operation—Its Present Status**—Rodric O'Connor, M.D., Oakland.

Discussion by Jay R. Sharpsteen, M.D., Oakland.

3:00 – **Improved Method in Intranasal Dacryocystorhinostomy**—Meyer Wiener, M.D., by invitation, Coronado.

Discussion by Commander Robert H. Ward (MC), U.S.N., San Diego.

3:30 – **The Lancaster Red-Green Test in Ocular Muscle Diagnosis**—J. P. McBride, M.D., Los Angeles.

Discussion by Edwin S. Wright, M.D., North Hollywood.

4:00 – **Simplified Fundus Photography** — Edwin S. Wright, M.D., North Hollywood.

Discussion by John Langton, M.D., Glendale.

WEDNESDAY, MAY 3

9:30 – Room 8, Conference Building

9:30 – **Radiology in the Practice of Otolaryngology**—James B. Irwin, M.D., San Diego.

Discussion.

10:00 – **Anesthesia for Adult Adenotonsillectomy—Use of Intravenous Sodium Pentothal Combined with Local Procaine Infiltration**—Lee Shahinian, M.D., San Francisco.

Discussion.

10:30 – **Practical Aspects of Pharyngeal Infection, with Kodachrome Slide Presentation**—Robert W. Godwin, M.D., Long Beach.

10:50 – **Intermission.**

11:00 – **Business Meeting**—Election of Section Officers.

11:10 – **Visible Mouth Lesions** — Motion Pictures in Color—Eugene S. Hopp, M.D., San Francisco.

Discussion.

11:50 – **Vasomotor Rhinitis—Some Aspects of Etiology and Management**—Harold Owens, M.D., Los Angeles.

Discussion by Francis O. Morris, M.D., Whittier.

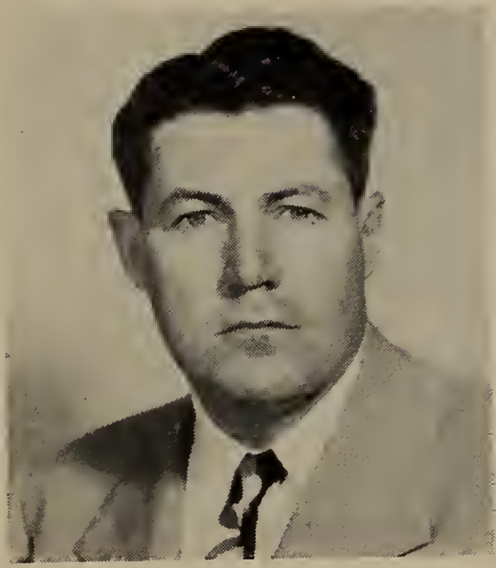
12:20 – **Management of Tumors of Nasal Cavity, Paranasal Sinuses and Nasopharynx**—S. L. Perzik, M.D., Beverly Hills.

Discussion by Joel Pressman, M.D., Beverly Hills.

INDUSTRIAL MEDICINE AND SURGERY

Nelson J. Howard, M.D., San Francisco, *Chairman*
Robert K. Gustafson, M.D., Pasadena, *Vice-Chairman*
Robert C. Sanderson, M.D., Sacramento, *Secretary*

NELSON J. HOWARD
Chairman
Industrial Medicine and Surgery



HERBERT C. SANDERSON
Secretary
Industrial Medicine and Surgery

MONDAY, MAY 1

9:30 – Room 4, Conference Building

9:30 – **Treatment of Acute Infections of the Hand**—Edmond Dana Butler, M.D., San Francisco.

Discussion by J. T. Wells, M.D., San Diego, and Joseph McGuiness, M.D., San Francisco.

10:00 – **Treatment of Difficult and Involved Colles' Fractures**—Frank Cox, M.D., San Francisco.

Discussion by Francis E. West, M.D., San Diego, and W. Stirling Clark, M.D., Ventura.

10:30 – **Management of Ulcers, Edema of the Leg, Swelling After Fractures**—R. Stanton Sherman, M.D., San Francisco.

Discussion by Walter Scott, M.D., Hollywood, and M. Laurence Montgomery, M.D., San Francisco.

11:00 – **Operative Treatment of Intertrochanteric Fractures of the Femur** — Francis E. West, M.D., San Diego.

Discussion by Daniel Levinthal, M.D., Beverly Hills.

11:30 – **Chairman's Address: Discussion of California Industrial Compensation Fee Schedule Problems**—Nelson Howard, M.D., San Francisco.

TUESDAY, MAY 2

2:00 – Room 4, Conference Building

2:00 – **Myocardial Infarction in Industrial Medicine**—James H. Thompson, M.D., San Francisco.

Discussion by Leon Lewis, M.D., Berkeley, and Don Gardner, M.D., San Francisco.

2:25 – **Errors in Treatment of Fractures of Long Bones**—Orris R. Myers, M.D., Eureka.

Discussion by Douglas Toffelmier, M.D., Oakland.

2:50 – **Subdural Hydroma, Diagnosis and Treatment**—William T. Grant, M.D., Los Angeles.

Discussion by Howard A. Black, M.D., Sacramento, and Edmund Morrissey, M.D., San Francisco.

3:15 – **Plastic Repair and Management of Wounds, Burns, and Ulcers**—Edward S. Lamont, M.D., Hollywood.

Discussion by Mertin Hatch, M.D., and Albert Daniels, M.D., San Francisco.

3:40 – **Surgical Treatment of Chronic Osteomyelitis**—Robert Bingham, M.D., Riverside.

Discussion by Harold Crowe, M.D., Los Angeles, and Fraser MacPherson, M.D., San Diego.

4:05 – **New or Old**—Robert E. Hughes, M.D., Hollywood.

Discussion by Charles E. Grayson, M.D., Sacramento, and A. Justin Williams, M.D., San Francisco.

4:30 – **Post-Traumatic Headache** — A. A. Raney, M.D., Los Angeles.

Discussion by O. W. Jones, M.D., San Francisco.

OBSTETRICS AND GYNECOLOGY

Donald A. Dallas, M.D., San Francisco, *Chairman*
Leon Krohn, M.D., Los Angeles, *Vice-Chairman*
Woodburn K. Lamb, M.D., Berkeley, *Secretary*

D. A. DALLAS
Chairman
Obstetrics and Gynecology

WOODBURN K. LAMB
Secretary
Obstetrics and Gynecology

SUNDAY, APRIL 30

2:00 – Room 3, Conference Building

2:00 – Report of the Committee on the Abortion Problem in California—Donald G. Tollefson, M.D., Chairman, Los Angeles.

2:40 – Coccidioidomycosis as a Complication of Pregnancy—John E. Vaughn, M.D., and Hall Ramirez, M.D., Bakersfield.

Discussion by Charles Smith, M.D., San Francisco.

3:10 – Pregnandiol Determination as a Guide to Therapy in the Management of Threatened and Habitual Abortion—Gordon Rosenblum, M.D., Los Angeles.

Discussion by Leon J. Krohn, M.D., Los Angeles.

3:40 – The Obstetrician's Responsibility to the Rh-Negative Mother: The Management of the Rh-Sensitized Obstetrical Patient—Bruce B. Rolf, M.D., Los Angeles.

Discussion by Phillip Sturgeon, M.D., Los Angeles.

MONDAY, MAY 1

9:30 – Room 3, Conference Building

9:30 – The Surgical Treatment of Uterine Prolapse and Genital Relaxations—Paula Horn, M.D., Los Angeles.

Discussion by Harold Marshall, M.D., Glendale.

10:00 – Further Studies in the Measurement of the Anterior Pelvic Depth—John C. McDermott, M.D., Los Angeles.

Discussion by James V. McNulty, M.D., Hollywood.

10:30 – Conservative Management of Third Trimester Bleeding—Edmund W. Overstreet, M.D., San Francisco.

Discussion by George E. Judd, M.D., Los Angeles.

11:00 – Urinary Tract Infections in Obstetrics and Gynecology—R. Gordon Douglas, M.D., New York, N.Y., by invitation.

TUESDAY, MAY 2

2:00 – Room 3, Conference Building

2:00 – Business Meeting.

2:20 – Experiences with Caudal Analgesia in a Small Community Hospital—Arnold Manor, M.D., Monterey.

Discussion by George C. Downing, M.D., Palo Alto.

2:50 – Chairman's Address—Donald A. Dallas, M.D., San Francisco.

3:10 – An Evaluation of Cesarean Section Today, Based on 1,265 Consecutive Sections—T. R. Nanninga, M.D., Alhambra.

Discussion by Donald de Carle, M.D., San Francisco.

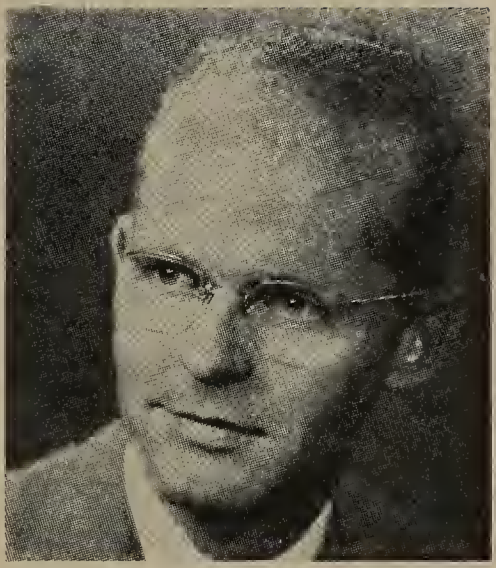
3:40 – Postural Pains of Pregnancy: Part I, Parietal Neuralgia in Pregnancy—Lowell F. Bushnell, M.D., Los Angeles.

Discussion by Ernest Doud, M.D., San Diego.

PATHOLOGY AND BACTERIOLOGY

C. S. Small, M.D., Loma Linda, *Chairman*
Warren Bostick, M.D., San Francisco, *Secretary*
Leon J. Tragerman, M.D., Los Angeles, *Assistant Secretary*

C. S. SMALL
Chairman
Pathology and Bacteriology



WARREN BOSTICK
Secretary
Pathology and Bacteriology

SUNDAY, APRIL 30

2:00 – Room 4, Conference Building

2:00 – **Mikulicz Disease**—Jesse L. Carr, M.D., San Francisco.

2:30 – **Diseases and Death**—Emil Bogen, M.D., Olive View, Edward M. Butt, M.D., Los Angeles, and Arthur Djong, M.D., by invitation, Los Angeles.

3:00 – **Pathology of Glomerulonephritis** — E. T. Bell, M.D., Minneapolis, Minnesota, by invitation.

3:30 – **Personal Experiences with the Huggins-Miller-Jensen Serological Test for Abnormal Proteins** — Reuben Straus, M.D., Sol Gross, M.D., and C. J. Wrobel, M.D., Beverly Hills.

4:00 – **Recess — Annual Meeting of California Society of Pathologists.**

MONDAY, MAY 1

9:30 – Room 5, Conference Building

9:30 – **Surface Active Agents as Disinfectants Against Tubercle Bacilli**—C. Richard Smith, M.D., Los Angeles.

10:00 – **Incidence of Carcinoma of the Prostate in Cirrhosis of the Liver**—Varner J. Johns, Jr., M.D., Los Angeles, and A. E. Hurst, M.D., Riverside.

10:30 – **Early Carcinoma of the Cervix Uteri**—Lt. S. S. Sarkisian (MC) USN, by invitation, San Diego.

Discussion opened by Capt. A. W. Eaton (MC) USN, San Diego.

11:00 – **Pathology of Diabetes Mellitus**—E. T. Bell, M.D., Minneapolis, Minnesota, by invitation.

11:30 – **Present Status of Coccidioidomycosis in Southern California**—John S. Kessel, Ph.D., Los Angeles, by invitation.

MONDAY, MAY 1

2:00 – Room 4, Conference Building

2:00 – **Pulmonary Embolism Due to Amniotic Fluid**—Charles M. Blumenfeld, M.D., Sacramento.

2:15 – **Chairman's Address**—C. S. Small, M.D., Loma Linda.

2:30 – **Etiologic Studies on Hodgkin's Disease** — Warren L. Bostick, M.D., San Francisco.

3:00 – **The Application of the Cytologic Technique to the Diagnosis of Gastric Carcinoma** — Richard Skahen, M.D., San Francisco, by invitation.

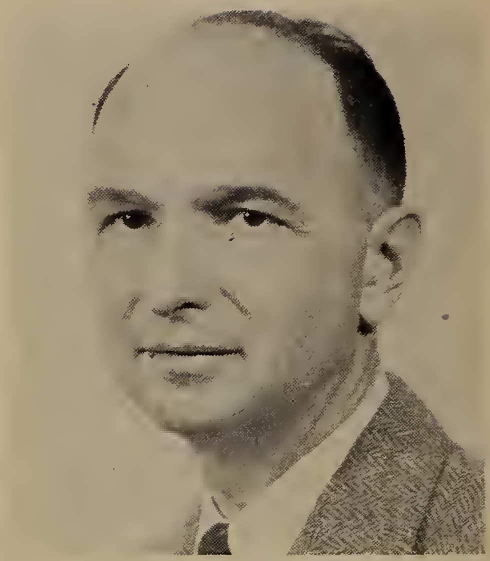
3:30 – **Diagnosis of Tuberculosis by Examination of Bone Marrow Sections**—Sheldon H. Stuurmans, M.D., Los Angeles.

4:00 – **Business Meeting and Election of Officers.**

PEDIATRICS

Carl A. Erickson, Pasadena, *Chairman*
Richard D. Cutter, Palo Alto, *Secretary*
Joseph W. St. Geme, Los Angeles, *Assistant Secretary*

CARL A. ERICKSON
Chairman, Pediatrics



RICHARD D. CUTTER
Secretary, Pediatrics

SUNDAY, APRIL 30

2:00 – Puppet Theatre, Palisades Building

Joint Meeting with Sections on Allergy and General Practice

For Program, see Section on Allergy

MONDAY, MAY 1

9:30 – Room 13, Conference Building

9:30 – **Feeding of Premature Infants**—Commander S. M. Abelson (M.C.), U.S.N., by invitation, San Diego.
Discussion.

10:00 – **Funnel Chest (Pectus Excavatum) in Infancy and Adult Life**—A. Lincoln Brown, M.D., San Francisco, and Orrin Cook, M.D., San Francisco, by invitation.
Discussion.

10:30 – **Edema Control in Diseases of the Kidney**—Logan E. Jackson, M.D., Long Beach.
Discussion.

11:00 – **Leading Causes of Childhood Death**—Esther B. Clark, M.D., Palo Alto.
Discussion.

11:30 – **Retrolental Fibroplasia**—Wendel Irvine, M.D., Los Angeles.
Discussion.

TUESDAY, MAY 2

9:30 – Room 13, Conference Building

Panel Discussion
What's New in Pediatrics

Moderator: Harry F. Dietrich, M.D., Beverly Hills

9:30 – **Antihistamines in the Common Cold**—Milton A. Katz, M.D., Long Beach.

9:40 – **Antibiotics**—Barbara Halpern, M.D., Beverly Hills.

9:50 – **Cardiac Catheterization** — Richard Cosby, M.D., Pasadena, by invitation.

10:00 – **Influenza Vaccination**—Sam W. Woolington, M.D., Long Beach.

10:10 – **Collagenous Diseases** — H. Russell Fisher, M.D., Los Angeles.

10:20 – **Use of Alidase in Subcutaneous Fluids in Prematures**—Peter Kalick, M.D., Los Angeles, by invitation.

10:30 – **Recess.**

10:50 – **Sleep Problems in Infancy**—Sidney Lasell, M.D., Pasadena, by invitation.

11:00 – **Ear, Nose, and Throat in Children**—B. Poland Cunningham, M.D., San Diego.

11:10 – **Use of Radium in Nasopharynx**—Durwin H. Brownell, M.D., San Diego.

11:20 – **Dental Care**—George O. Boucher, M.D., Long Beach.

11:30 – **Questions** in writing to be passed to Moderator.

11:50 – **Business Meeting.**

TUESDAY, MAY 2

2:00 – Room 13, Conference Building

Joint Meeting with Section on Public Health

For Program, see Section on Public Health

PSYCHIATRY AND NEUROLOGY

Henry W. Newman, M.D., San Francisco, *Chairman*
George Creswell Burns, M.D., Compton, *Secretary*

HENRY W. NEWMAN
Chairman
Psychiatry and Neurology

GEORGE C. BURNS
Secretary
Psychiatry and Neurology

MONDAY, MAY 1

2:00 – Room 8, Conference Building

2:00 – **Chairman's Address: Antabuse and the Metabolism of Alcohol** — Henry W. Newman, M.D., San Francisco.

Discussion.

2:30 – **Antabuse in the Treatment of Alcoholism in a Private General Hospital**—A. E. Bennett, M.D., Lewis G. McKeever, M.D., by invitation, and Richard Turk, M.D., by invitation, Berkeley.

Discussion.

3:00 – **Antabuse in the Treatment of Alcoholism**—John D. Moriarty, M.D., Los Angeles.

Discussion by Nicholas Bercel, M.D., Los Angeles, and William Northrup, M.D., Altadena.

3:30 – **A Program for the Rehabilitation of Some Alcoholics**—Carl Tillman, M.D., Oakland.

Discussion by David Lester, M.D., San Diego, and Ernest G. Lion, M.D., San Francisco.

4:00 – **Fate of State Hospital Admissions**—Wrenshall A. Oliver, M.D., Imola.

Discussion by O. B. Jensen, M.D., Livermore, and George Targan, M.D., Spadra.

4:30 – **Child Development**—Meyer H. Newman, M.D., Spadra.

Discussion by Robert E. Wyers, M.D., Norwalk.

TUESDAY, MAY 2

9:30 – Room 8, Conference Building

9:30 – **Business Meeting, Election of Section Officers.**

9:40 – **Neuropsychiatry in San Bernardino**—Joseph Perlson, M.D., San Bernardino.

Discussion by George N. Thompson, M.D., and J. M. Nielsen, M.D., Los Angeles.

10:10 – **Amnesia for Limbs: Diagnostic Value of Syndrome**—J. M. Nielsen, M.D., Los Angeles.

Discussion by Clarence W. Olsen, M.D., and Frank W. Bailey, M.D., Beverly Hills.

10:40 – **The Distribution and Histological Nature of the Lesions in the Central Nervous System in Western Equine and St. Louis Encephalomyelitis**—Knox H. Finley, M.D., San Francisco.

Discussion.

11:10 – **Convulsive Seizures in Cerebral Atrophy**—Leslie B. Mann, Jr., M.D., by invitation, Los Angeles.

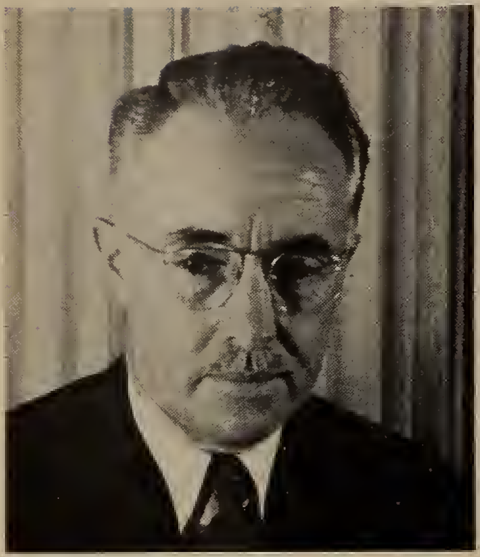
Discussion.

11:40 – **Intracranial Tumors Simulating Vascular Lesions of the Brain**—George David Hjartarson, M.D., by invitation, Los Angeles.

Discussion.

PUBLIC HEALTH

Edward Lee Russell, M.D., Santa Ana, *Chairman*
Martin Mills, M.D., Richmond, *Secretary*
Ira O. Church, M.D., Santa Barbara, *Assistant Secretary*



EDWARD LEE RUSSELL
Chairman, Public Health

MARTIN MILLS
Secretary, Public Health

SUNDAY, APRIL 30

2:00 – Room 2, Conference Building

Panel Discussion

What's Wrong with Private Physician-Health Department Relationships? How Can They Be Improved?

Chairman: Edward Lee Russell, M.D., Santa Ana

2:00 – Lewis A. Alesen, M.D., Los Angeles.

2:20 – Stanford F. Farnsworth, M.D., Oakland.

2:40 – Carroll B. Andrews, M.D., Sonoma.

3:00 – Edward Lee Russell, M.D., Santa Ana.

3:20 – Rebuttal.

3:40 – Questions and Answers from the floor.

4:00 – Recess: Business Meeting and Election of Officers.

MONDAY, MAY 1

9:30 – Room 2, Conference Building

9:30 – A Health Department Stimulates Community Thinking in Mental Health — David Frost, M.D., Alameda, and Genevieve Anderson, R.N., by invitation, Alameda.

10:00 – Track Stars Are Not Barrel-Chested—Samuel A. Weisman, M.D., Los Angeles.

10:30 – The Nutritional Status of the Aged—Its Public Health Implications — Harold D. Chope, M.D., Redwood City.

11:00 – The California Tumor Registry—A Progress Report Covering 60,000 Cases Since 1942—Lester Breslow, M.D., James Ellis, M.D., Berkeley, Martha Eaton, Sc.M., and Goldy Kleinman, M.A., by invitation, Alameda.

TUESDAY, MAY 2

2:00 – Room 2, Conference Building

Joint Meeting with Section on Pediatrics

Symposium

Recent Advances in Knowledge and Care of Bulbar and Respiratory Poliomyelitis

2:00 – Introductory Remarks.

2:05 – Recent Advances in Isolation, Identification and Epidemiology of Poliomyelitis—Charles Pait, M.D., Los Angeles, by invitation.

2:30 – Diagnostic Problems in Poliomyelitis and How They Are Met—Albert G. Bower, M.D., Pasadena.

2:55 – Management of the Respirator Case—Harold E. West, M.D., by invitation, Whittier.

3:20 – Serum Protein Changes in Acute Poliomyelitis—Jack S. Chudnoff, M.D., Los Angeles.

3:45 – The Electrolyte Balance in Acute Poliomyelitis—A. L. Cheney, Ph.D., by invitation, Los Angeles.

Discussion.

* * *

Note: Meetings of the California Conference of Local Health Officers will be held in Room 2, Conference Building, on Monday at 2 p.m. and Wednesday, 9:30 a.m. and 2 p.m.

RADIOLOGY

Richard T. Taylor, M.D., Los Angeles, *Chairman*
Sydney F. Thomas, M.D., Palo Alto, *Secretary*

RICHARD T. TAYLOR
Chairman, Radiology

SYDNEY F. THOMAS
Secretary, Radiology

SUNDAY, APRIL 30

2:00 – Room 12, Conference Building

2:00 – **Roentgen Treatment of a Granulosa Cell Carcinoma of the Ovary**—Robert B. Engle, M.D., Pasadena.

Discussion by James Noyan, M.D., Los Angeles.

2:30 – **Roentgen Therapy in Atypical Pneumonia**—Harold P. Tompkins, M.D., Los Angeles.

Discussion by Frank Binkley, M.D., Pasadena.

3:00 – **Recess**: Business Meeting.

3:10 – **Recess**: Annual Meeting of Pacific Roentgen Society.

MONDAY, MAY 1

9:30 – Recital Hall, Palisades Building

Joint Meeting with Sections on General Medicine, General Surgery, General Practice and Anesthesiology

For Program, see Section on General Surgery

TUESDAY, MAY 2

2:00 – Room 12, Conference Building

2:00 – **A New Position for Cholecystography**—John J. Wells, M.D., San Diego.
Discussion by John M. Rumsey, M.D., San Diego.

2:30 – **Small Intestinal Rupture Due to Non-Penetrating Abdominal Injury; a Roentgenological Study**—George Jacobson, M.D., and Ray A. Carter, M.D., Los Angeles.
Discussion by John R. Paxton, M.D., Glendale.

3:00 – **Roentgen Diagnosis of Intra-Abdominal Hernia**—A. Justin Williams, M.D., and Fred L. Hewes, M.D., San Francisco.
Discussion by Martin Debenham, M.D., San Francisco.

3:30 – **Roentgen Diagnosis of Cysts and Odontogenic Tumors of the Jaws**—Frank C. Binkley, M.D., Pasadena.
Discussion by Ernest R. Bowman, M.D., San Francisco.

4:00 – **Preliminary Studies of the Gastrointestinal Tract with Colloidal Barium**—Henry Kaplan, M.D., San Francisco, and Henry H. Jones, M.D., by invitation, San Francisco.
Discussion.

4:30 – **The Management of Breast Cancer; Surgical and Radiation Therapy Considerations**—Justin J. Stein, M.D., Orville Meland, M.D., and William Costolow, M.D., Los Angeles.
Discussion by A. H. Dowdy, M.D., Los Angeles.

UROLOGY

Arthur B. Cecil, M.D., Los Angeles, *Chairman*
James Ownby, Jr., M.D., San Francisco, *Vice-Chairman*
Donald R. Smith, M.D., San Francisco, *Secretary*

ARTHUR B. CECIL
Chairman, Urology

DONALD R. SMITH
Secretary, Urology

MONDAY, MAY 1

2:00 – Room 11, Conference Building

Symposium

Prostatectomy

2:00 – Indications for the Different Approaches to Prostatectomy—Roger W. Barnes, M.D., Los Angeles.

2:20 – Suprapubic Transvesical Prostatectomy—Lyle G. Craig, M.D., Pasadena.

2:40 – Retropubic Prostatectomy—Samuel K. Bacon, M.D., Hollywood.

3:00 – The Value of the Perineal Approach in Prostatectomy for Benign Adenoma of the Prostate—Elmer Belt, M.D., Los Angeles.

3:20 – Suprapubic Prostatectomy with Tight Closure of the Bladder—Wilbur G. Rogers, M.D., Glendale.

Discussion opened by I. E. LeDuc, M.D., and Ralph B. Mullenix, M.D., San Diego.

TUESDAY, MAY 2

9:30 – Room 11, Conference Building

9:30 – Chairman's Address: True Hermaphroditism —Arthur B. Cecil, M.D., Los Angeles.

10:00 – Vasoepididymostomy in the Treatment of Oligospermia — Lewis Michelson, M. D., San Francisco.

Discussion.

10:30 – Replacement Therapy in the Elderly Surgical Patient—Richards Lyon, M.D., San Francisco, by invitation.

Discussion.

11:00 – Carcinoma of the Bladder—James S. Elliot, M.D., Berkeley.

Discussion.

11:30 – Business Meeting and Election of Officers.

WEDNESDAY, MAY 3

9:30 – Room 11, Conference Building

9:30 – Management of Ureteral Calculi—Jesse L. Brockow, M.D., Los Angeles.

Discussion.

10:00 – Giant Hydronephrosis Causing Biliary Obstruction and Contralateral Hydronephrosis—William R. Smart, M.D., San Rafael, by invitation.

Discussion.

10:30 – A Rare Renal Lesion Simulating Tumor: A Case Report — James M. Whisenand, M.D., by invitation, and Vincent Moore, M.D., by invitation, San Diego.

Discussion.

11:00 – Hematuria: Causative Factors, Mortality Rate in Early Diagnosis, Late Diagnosis—Illustrated by Motion Pictures—James C. Negley, M.D., Glendale.

Discussion.

Scientific Exhibits

Main Floor, Conference Building

Scientific Exhibit Space No.	*Exhibit*
1–2	**Cysto-urethrography** — James M. Whisenand, M.D., and Vincent Moore, M.D., San Diego.
3	**Oxytocics and the Gravid Uterus**—A. R. Abarnel, M.D., Los Angeles.
4	**Tumors of the Parotid Gland**—Donald E. Ross, M.D., Los Angeles.
5	**Lesions of the Calvarium (Skull)** — John J. Wells, M.D., San Diego.
6	**Hidden Pulmonary Lesions Revealed by Planigram** — Charles Pokorny, M.D., J. D. Davis, M.D., and LeRoy Hyde, M.D., Van Nuys.
7	**Polypoid Lesions of the Colon** — Robert A. Scarborough, M.D., Russel R. Klein, M.D., and Frank S. Windholz, M.D., San Francisco.
8	**Newborn Needs Placental-Circuit Blood**—A. M. McCausland, M.D., Frances Holmes, M.D., and W. R. Schumann, M.D., Los Angeles.
9	**Irradiation of Benign Nasopharyngeal Lesions**—M. E. Mottram, M.D., Harold A. Hill, M.D., and L. Henry Garland, M.D., San Francisco.
10	**The Tuohy Corneal Lens**—Maurice W. Nugent, M.D., and Kevin M. Tuohy, M.D., Los Angeles.
11	**Correlative Study of Cardiac Diseases**—Irving Treiger, M.D., Beverly Hills.
12	**Clinical and Surgical Pathology of the Thyroid Gland**—B. H. Sprague, M.D., W. H. Griffith, M.D., and Lawrence Adams, M.D., Los Angeles.
13	**Tension Neuralgias (Low Back Pain, Sciatica, etc.)** — Laurence Jones, M.D., Beverly Hills, Wesley M. Farr, M.D., El Segundo, Harold E. Petersen, M.D., San Fernando, and Royal Payne, M.D., Hollywood.
14	**Intestinal Obstruction: Diagnosis, Management, Complications**—J. Howard Payne, M.D., and Norman H. Blatherwick, M.D., Los Angeles, and William Roe, M.D., Van Nuys.
15	**Clinical Evaluation of NU-445 ("Gantrisin") in Genito-urinary Infections**—Elmer Belt, M.D., B. Lyman Stewart, M.D., J. Jerry Lash, Los Angeles.
16	**Cysts and Tumors of the Jaws**—George S. Sharp, M.D., Eugene W. Demaree, M.D., Robert C. Wood, M.D., Herbert F. Williams, M.D., and Frank C. Binkley, M.D., Pasadena.
17	**Cytologic Diagnosis of Cancer**—Seymour M. Farber, M.D., Herbert Traut, M.D., Lewis Morrison, M.D., and Frank Hinman, Jr., M.D., San Francisco.

Organizational Exhibits

Main Floor, Conference Building

Technical Exhibit Space No.	*Exhibit*
14	**C.M.A. Blood Bank Commission**
82–83	**C.M.A. Cancer Commission**
26	**C.M.A. Postgraduate Activities Committee**
71	**California Physicians' Service**
17	**Los Angeles County Physicians Aid Association.**

Motion Picture Program

(Sub-committee: Arthur E. Smith, M.D., Los Angeles, *Chairman*)

SUNDAY, APRIL 30

2:00 – Room 8, Conference Building

2:00 – Radical Mastectomy—Donald E. Ross, M.D., Los Angeles.

2:20 – Vagotomy for Ulcerative Colitis—Philip Thorek, M.D., Chicago.

2:35 – An Improved Technique for the Operative Treatment of Anorectal Lesions — Louis E. Moon, M.D., and J. B. Christensen, M.D., Omaha.

3:20 – Open Submucosal Ureterosigmoidostomy — Frank Hinman, Jr., M.D., San Francisco.

3:40 – Surgical Correction of Convergent Strabismus—David M. Harwood, M.D., Huntington Park.

4:00 – Application of Thick Split Skin Grafts — James Barrett Brown, M.D., and Frank McDowell, M.D., St. Louis.

4:35 – (1) One-Stage Suprapubic Prostatectomy, Vasectomy and Orchiectomy. (2) Nephropexy Without Disturbing or Incising the Renal Capsule Utilizing Fatty Capsule for Support—James C. Negley, M.D., Glendale.

MONDAY, MAY 1

9:00 – Puppet Theatre, Palisades Building

9:00 – Support of Paralyzed Face with Fascia — James Barrett Brown, M.D., and Frank McDowell, M.D., St. Louis.

9:20 – Epiphrenic Esophageal Diverticulectomy — Howard S. Drake, M.D., Los Angeles.

9:35 – Posterior Polya Partial Gastrectomy (Subtotal) for Carcinoma of the Stomach—Waltman Walters, M.D., Rochester, Minn.

9:55 – Transverse Abdominal Incision in Cesarean Section — Donald G. Tollefson, M.D., and Keith P. Russell, M.D., Los Angeles.

10:15 – Extrafacial Lucite Plombage—Alfred Goldman, M.D., Beverly Hills.

10:45 – One-Stage Special Clamp Esophageal Diverticulectomy — William P. Kroger, M.D., Los Angeles.

11:00 – Splenectomy—R. W. McNealy, M.D., Chicago.

11:20 – Surgical Correction of Spontaneous Pneumothorax—Gerald L. Crenshaw, M.D., Oakland.

11:35 – Laryngoglossectomy — S. L. Perzik, M.D., Beverly Hills.

MONDAY, MAY 1

2:00 – Puppet Theatre, Palisades Building

2:00 – Subtotal Thyroidectomy Demonstrating Exposure of the Recurrent Laryngeal Nerve—James R. Johnson, M.D., Inglewood.

2:15 – Fractures—An Introduction — Harrison L. McLaughlin, M.D., New York City.

2:45 – Repair of Diaphragmatic Hernia with Fascia Lata Using the Transthoracic Approach—J. Norman O'Neill, M.D., Los Angeles.

3:00 – Vagus Resection for Peptic Ulcer—Transthoracic Approach—Edward C. Pallette, M.D., Los Angeles.

3:15 – An Operation for Correction of Pterygium—Robert S. Irvine, M.D., and George W. Pierce, M.D., San Francisco.

3:30 – Subtotal Thyroidectomy—Frank H. Lahey, M.D., Boston.

4:00 – Correction of Advanced Rhinophyma by Means of Reconstructive Plastic Surgery — Arthur E. Smith, M.D., Los Angeles.

4:30 – Surgical Treatment of Patent Ductus Arteriosus—John C. Jones, M.D., Los Angeles.

4:45 – Injuries of the Peripheral Nerves — Loyal Davis, M.D., Chicago.

TUESDAY, MAY 2

9:00 – Room 3, Conference Building

9:00 – Paralysis Agitans: Surgical Treatment — Tracy J. Putnam, M.D., Beverly Hills.

9:30 – Defibrillation of the Heart—Claude S. Beck, M.D., Cleveland.

9:45 – Radical Mastoid Operation—Howard P. House, M.D., Los Angeles.

10:05 – The Surgical Treatment for Congenital Pyloric Stenosis—Philip Thorek, M.D., Chicago.

10:20 – The Shoulder Joint—A Multi-Purpose Plastic Repair—Laurence Jones, M.D., Beverly Hills.

10:50 – Thoracolumbar Sympathectomy for Hypertension — Theodore B. Massell, M.D., Van Nuys.

11:05 – Some Considerations in the Treatment of Skin Cancer—Neal Owens, M.D., New Orleans.

11:35 – Inguinal Hernioplasty—Douglas Donath, M.D, Pasadena.

11:50 – A New Method of Repair of Vesicovaginal Fistulae—Elmer Belt, M.D., Los Angeles

TUESDAY, MAY 2

2:00 – Room 2, Conference Building

2:00 – Technique in the Routine Examination of Ocular Motility—Conrad J. Berens, M.D., and Louis J. Girard, M.D., New York City.

2:30 – Athetosis: Manipulation and Treatment — Tracy J. Putnam, M.D., Beverly Hills.

3:00 – Gastric Resection for Duodenal Ulcer—G. Arnold Stevens, M.D., Beverly Hills.

3:15 – Transcolonic Removal of Benign Adenomatous Polyp—Harry E. Bacon, M.D., Philadelphia.

3:30 – **Anatomic Dissection of the Knee Showing Anatomy and Mechanics of the Ligaments**—John R. Black, M.D., Los Angeles.

3:50 – **Correction of Nasal Deformities**—James Barrett Brown, M.D., and Frank McDowell, M.D., St. Louis.

4:10 – **Removal of Upper Lid Carcinoma** — Alston Callahan, M.D., Birmingham, Alabama.

4:35 – **Burns**—Neal Owens, M.D., New Orleans.

WEDNESDAY, MAY 3

9:00 – Puppet Theatre, Palisades Building

9:00 – **Retropubic Prostatectomy** — McCleery Glazier, M.D., Los Angeles.

9:15 – **Excision of Branchial Fistula** — Conrad J. Baumgartner, M.D., Beverly Hills.

9:35 – **Internal Wiring of Facial Fractures** — William M. Adams, M.D., Memphis.

10:00 – **Cooper's Ligament Herniorrhaphy for Indirect Hernia Associated with Direct Hernia**—Jack M. Farris, M.D., Los Angeles.

10:15 – **Free Fascia Transplant Repair for Inguinal Hernia**—Louis C. Bennett, M.D., Los Angeles.

10:30 – **Injuries of the Peripheral Nerves** — Loyal Davis, M.D., Chicago.

10:55 – **Extensive Skin Grafting for the Reconstruction of Tissues Destroyed by Third and Fourth Degree Burns** — Arthur E. Smith, M.D., Los Angeles.

11:25 – **The Function of the Ear in Health and Disease**—H. G. Kobrak, M.D., Joseph E. Hind, M.D., and Robert B. Miller, M.D., Chicago.

WEDNESDAY, MAY 3

2:00 – Puppet Theatre, Palisades Building

2:00 – **Safer Gastrectomy**—L. A. Alesen, M.D., Los Angeles.

2:15 – **Billroth No. 1 Partial Gastrectomy**—Waltman Walters, M.D., Rochester, Minn.

2:35 – **Total Hysterectomy**—W. H. Brownfield, M.D., Los Angeles.

2:50 – **Reconstructive Biliary Surgery** — Joseph de los Reyes, M.D., Los Angeles.

3:10 – **Endotracheal Anesthesia**—Charles F. McCuskey, M.D., Los Angeles.

3:30 – **A Bedside Back Rest for Use in Geriatric Medicine and Surgery**—Hugh Toland Jones, M.D., Los Angeles.

3:45 – **Radical Dissection of the Neck** — Frank H. Lahey, M.D., Boston.

POST-CONVENTION MEETINGS

Various associations and societies will be holding post-convention meetings in San Diego and environs. Amongst these will be the California Heart Association which is scheduled to meet at Hospitality House, Balboa Park, Wednesday afternoon, May 3.

ANNUAL GOLF TOURNAMENT

Monday Afternoon, May 1

SAN DIEGO COUNTRY CLUB

All members attending the meeting are welcome to play. Numerous prizes will be awarded. Make reservations with Kenneth Young, Executive Secretary, San Diego County Medical Society, Medical-Dental Building, San Diego 1, telephone FRanklin 9-0224.

INDEX TO SPEAKERS

San Diego, April 30-May 3, 1950

Name and City — *Page*

A

Abelson, S. M., *San Diego* 286
Aird, Robert B., *San Francisco*, et al. 274
Alesen, Lewis A., *Los Angeles* 288
Alexander, Harold B., *Pasadena* 282
Ancona, G. R., *San Francisco*, et al. 278
Anderson, Nelson Paul, *Los Angeles*, et al. 280
Andrews, Carroll B., *Sonoma* 288

B

Bacon, Samuel K., *Hollywood* 290
Barnes, Roger W., *Los Angeles* 290
Batten, Douglass H., *San Diego* 279
Baumgartner, Conrad J., *Beverly Hills* 275
Bell, E. T., *Minneapolis, Minnesota* 273, 285
Belt, Elmer, *Los Angeles* 290
Bennett, A. E., *Berkeley, et al.* 287
Bingham, Robert, *Riverside* 283
Binkley, Frank C., *Altadena* 289
Blumenfeld, Charles M., *Sacramento* 285
Boland, Edward W., *Los Angeles* 274
Bogen, Emil, *Olive View*, et al. 285
Bostick, Warren L., *San Francisco* 285
Boucher, George O., *Long Beach* 286
Bower, Albert G., *Pasadena* 288
Breslow, Lester, *Berkeley*, et al. 288
Brock, Lois H., *San Francisco* 280
Brockow, Jesse L., *Los Angeles* 290
Brown, A. Lincoln, *San Francisco*, et al. 286
Brown, Maurice J., *San Diego* 276
Brownell, Durwin H., *San Diego* 286
Burkhart, Roger, *San Jose* 280
Bushnell, Lowell F., *Los Angeles* 284
Butler, Edmond Dana, *San Francisco* 283

C

Carr, Jesse L., *San Francisco* 285
Cecil, Arthur B., *Los Angeles* 290
Cheney, A. L., *Los Angeles* 288
Chope, Harold D., *Redwood City* 288
Chudnoff, Jack S., *Los Angeles* 288
Clark, Albert G., *San Francisco* 275
Clark, Esther B., *Palo Alto* 286
Coghlan, Charles C., *Los Angeles* 278
Cohen, Robert, *Bakersfield* 274
Cole, Warren H., *Chicago, Illinois* 273, 276
Conn, Jerome W., *Ann Arbor, Michigan* 273, 274, 275
Cosby, Richard, *Pasadena* 286
Cox, Frank, *San Francisco* 283
Craig, Lyle G., *Pasadena* 290
Cunningham, B. Poland, *San Diego* 286

D

Dallas, Donald A., *San Francisco* 284
Debenham, Martin W., *San Francisco*, et al. 276
Demaree, E. W., *Pasadena* 276
Denson, Judson Samuel, *Los Angeles* 279
Doud, Ernest A., *San Diego* 279
Douglas, R. Gordon, *New York, New York* 273, 284
Douglass, L. Parry, *San Francisco*, et al. 276
Doyle, John B., *Los Angeles* 274

E

Elliott, James S., *Berkeley* 290
Engle, Robert B., *Pasadena* 289

F

Farnsworth, Stanford F., *Oakland* 288
Finley, Knox H., *San Francisco* 287
Fisher, H. Russell, *Los Angeles* 286
Foster, Paul D., *Los Angeles* 280
Freeman, Norman E., *San Francisco* 275
Frost, David, *Alameda*, et al. 288

G

Gates, C. Y., *San Francisco*, et al. 275
Gerbode, Frank, *San Francisco* 273
Godman, Harold E., *San Diego* 279
Godwin, Robert W., *Long Beach* 282
Golseth, James, *Altadena* 274
Grant, William T., *Los Angeles* 283
Grimes, Orville F., *San Francisco*, et al. 275
Guinney, Francis E., *Los Angeles* 279
Gummess, Glen H., *Los Angeles* 277

H

Hall, A. Fletcher, *Santa Monica* 280
Halpern, Barbara, *Beverly Hills* 286
Harding, J. C. A., *San Diego* 280
Harper, Harold A., *San Francisco*, et al. 276
Henegar, George C., *Oakland* 276
Heron, Ivan C., *San Francisco* 277
Hjartarson, George David, *Los Angeles* 287
Homann, Ralph E., Jr., *Los Angeles* 274
Hopp, Eugene S., *San Francisco* 282
Horn, Paula, *Los Angeles* 284
Howard, Nelson, *San Francisco* 283
Hughes, Herbert, *San Diego* 277
Hughes, Robert E., *Los Angeles* 283
Hummer, George, *Santa Monica* 273

I

Ingham, Samuel D., *Los Angeles* 274
Irvine, Wendel, *Los Angeles* 286
Irwin, James B., *San Diego* 282
Ives, Elinor, *Los Angeles* 274

J

Jackson, Logan E., *Long Beach* 286
Jacobson, George, *Los Angeles*, et al. 289
Johns, Varner J., Jr., *Los Angeles*, et al. 285

Name and City *Page*

K

Kalick, Peter, *Los Angeles* 286
Kaplan, Henry, *San Francisco*, et al. 289
Katz, Milton A., *Long Beach* 286
Kerr, William J., Jr., *San Rafael*, et al. 274
Kessel, John S., *Los Angeles* 285
Kneeshaw, R. Stanley, *San Jose* 273

L

Lamont, Edward S., *Los Angeles* 283
Laqueur, Gert Ludwig, *San Francisco* 273
Lasell, Sidney, *Pasadena* 286
Lee, Russel V., *Palo Alto* 280
LeVan, Paul, *Los Angeles*, et al. 281
Lofgren, Robert O., *San Francisco* 280
Longmire, William P., Jr., *Los Angeles* 275
Lyon, Richards, *San Francisco* 290

M

MacLaren, W. R., *Pasadena* 278
MacKay, Chester H., *Hollywood* 280
MacKay, Eaton M., *LaJolla* 274
Mann, Leslie B., Jr., *Los Angeles* 287
Manor, Arnold, *Monterey* 284
Marshall, Glenn, *San Diego* 279
Mauser, Carl, *Oakland* 278
McBride, J. P., *Los Angeles* 282
McDermott, John C., *Los Angeles* 284
McIntosh, Thomas W., *Pasadena* 279
Meherin, J. Minton, *San Francisco* 276
Michelson, Lewis, *San Francisco* 290
Mills, Lloyd, *Los Angeles* 282
Moriarty, John D., *Los Angeles* 287
Murphy, Franklin D., *Kansas City, Kansas* 273
Myers, Orris R., *Eureka* 283

N

Nanninga, T. R., *Alhambra* 284
Negley, James C., Glendale 290
Newell, Robert R., *San Francisco* 273
Newman, Henry W., *San Francisco* 287
Newman, Meyer H., *Spadra* 287
Nielsen, J. M., *Los Angeles* 287

O

O'Connor, Roderic P., *Oakland* 282
Oliver, Wrenshall A., *Imola* 287
O'Neill, J. Norman, *Los Angeles* 276
Overstreet, Edmund W., *San Francisco* 284
Owens, Harold, *Los Angeles* 282

P

Pait, Charles F., *Los Angeles* 288
Pattison, Arthur C., Pasadena 275
Perlson, Joseph, *San Bernardino* 287
Perzik, S. L., *Beverly Hills* 282
Peters, Harry E., Jr., *Oakland* 276
Petit, Donald, *Pasadena* 277
Pettet, Charles H., *Los Angeles* 278

R

Raney, A. A., *Los Angeles* 283
Raney, Rupert, *Los Angeles* 274
Rickles, N. K., *Beverly Hills* 273
Rogers, Wilbur G., *Glendale* 290
Rolf, Bruce B., *Los Angeles* 284
Rosenblum, Gordon, *Los Angeles* 284
Ross, Donald E., *Los Angeles* 275
Rowe, Albert, Jr., *Oakland* 278
Rupp, Nevin H., *Los Angeles* 279
Russell, Edward Lee, *Santa Ana* 288

S

Salisbury, Peter F., *Los Angeles* 275
Sarkisian, S. S., *San Diego* 285
Schneiderman, Benjamin I., *Los Angeles* 279
Scholtz, Jud R., *Pasadena* 281
Schwartz, Walter F., *Pasadena*, et al. 280
Semenov, Herman, *Beverly Hills* 280
Shahinian, Lee, *San Francisco* 282
Shelton, E. Kost, *Los Angeles* 274
Sherman, R. Stanton, *San Francisco* 283
Shidler, Frederic P., *Menlo Park* 275
Skahen, Richard, *San Francisco* 285
Small, C. S., *Loma Linda* 285
Smart, William R., *San Rafael* 290
Smith, C. Richard, *Los Angeles* 285
Stein, Justin J., *Los Angeles*, et al. 289
Stevens, G. Arnold, *Beverly Hills* 276
Strange, Vance M., *San Francisco* 276
Straus, Reuben, *Beverly Hills*, et al. 285
Stuurmans, Sheldon H., *Los Angeles* 285

T

Thompson, James H., *San Francisco* 282
Thompson, Richard C., *San Francisco* 275
Tillman, Carl, *Oakland* 287
Tollefson, Donald G., *Los Angeles* 284
Tompkins, Harold P., *Los Angeles* 289
Tragerman, Leon J., *Los Angeles* 280
Tuft, Louis, *Philadelphia, Pennsylvania* 278
Tyler, Edward T., *Los Angeles* 277
Tyler, George C., *Los Angeles* 280

V

Van Meter, J. Ray, *Palo Alto* 274
Vaughn, John E., *Bakersfield*, et al. 284
Von Hagan, Karl, *Los Angeles* 274

W

Weisman, Samuel A., *Los Angeles* 288
Wells, John J., *San Diego* 289
West, Francis E., *San Diego* 283
West, Harold E., *Whittier* 288
Whisenand, James M., *San Diego*, et al. 290
White, Abraham, *Los Angeles* 274
Whiting, E. Gale, *Berkeley* 278
Wiener, Meyer, *Coronado* 282
Williams, A. Justin, *San Francisco*, et al. 289
Wilson, John L., *San Francisco* 276
Winer, Louis H., *Beverly Hills* 281
Woolington, Sam W., *Long Beach* 286
Wright, Edwin S., *North Hollywood* 282

Y

Yeager, Charles, *San Francisco* 274

C. M. A. Cancer Commission Pre-Convention Conference

U. S. GRANT HOTEL, SAN DIEGO
SATURDAY, APRIL 29.

The pre-convention conferences sponsored by the Cancer Commission will be held at the U. S. Grant Hotel on Saturday, April 29, the day preceding the opening of the California Medical Association meeting.

PATHOLOGY

PATHOLOGY—Gold Room, U. S. Grant Hotel

The pre-convention conference on Microscopic Tumor Pathology will be held from 9:30 a.m. to 12 noon and from 2 p.m. to 4:30 p.m., under the chairmanship of Dr. Edward Butt, Los Angeles. Dr. Louis Lichtenstein, Los Angeles, will be the moderator. Tumor diagnostic problems will be presented and discussed with emphasis on bone tumors. Members who attend this conference are requested to register now with Dr. Howard Ball, 233 A Street, San Diego.

RADIOLOGY

RADIOLOGY—Rose Room, U. S. Grant Hotel

The pre-convention conference on Radiology will be held from 9:30 a.m. to 12 noon and from 2 p.m. to 4:30 p.m., under the chairmanship of Dr. Earl R. Miller, San Francisco. Dr. R. F. Niehaus of San Diego is secretary.

SCIENTIFIC SESSIONS

	SUNDAY APRIL 30		MONDAY MAY 1		TUESDAY MAY 2		WEDNESDAY MAY 3	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
BALBOA PARK Palisades Bldg. Recital Hall	**10:00** General Meeting	**2:00** General Medicine	**9:30** General Surgery General Medicine General Practice Anesthesiology Radiology		**9:30** General Meeting and Clinical-Pathological Conference	**2:00** General Medicine	**9:30** General Meeting "What's New"	**2:00** General Surgery
Puppet Theatre		**2:00** Allergy General Practice Pediatrics	**9:00** Medical Motion Pictures	**2:00** Medical Motion Pictures	**9:30** General Practice	**2:00** General Surgery	**9:00** Medical Motion Pictures	**2:00** Medical Motion Pictures
Conference Bldg. Room 2		**2:00** Public Health	**9:30** Public Health			**2:00** Medical Motion Pictures		
Room 3		**2:00** Obstetrics and Gynecology	**9:30** Obstetrics and Gynecology		**9:00** Medical Motion Pictures	**2:00** Obstetrics and Gynecology		
Room 4		**2:00** Pathology and Bacteriology	**9:30** Industrial Medicine and Surgery	**2:00** Pathology and Bacteriology		**2:00** Industrial Medicine and Surgery		
Room 5		**2:00** Anesthesiology	**9:30** Pathology and Bacteriology			**2:00** Anesthesiology		
Room 8		**2:00** Medical Motion Pictures	**9:30** Allergy	**2:00** Psychiatry and Neurology	**9:30** Psychiatry and Neurology	**2:00** Eye, Ear, Nose and Throat	**9:30** Eye, Ear, Nose and Throat	
Room 11		**2:00** Dermatology and Syphilology	**9:30** Dermatology and Syphilology	**2:00** Urology	**9:30** Urology	**2:00** Dermatology and Syphilology	**9:30** Urology	
Room 12		**2:00** Radiology				**2:00** Radiology		
Room 13		**2:00** General Surgery	**9:30** Pediatrics		**9:30** Pediatrics	**2:00** Public Health Pediatrics		
HOTEL DEL CORONADO Ball Room		**5:00 House of Delegates**				**5:00 House of Delegates**		

COUNCIL OF THE C.M.A. MEETS DAILY AT 7:30 A.M. IN THE PATIO DINING ROOM, HOTEL DEL CORONADO

SCIENTIFIC EXHIBITS—MAIN FLOOR, CONFERENCE BUILDING

WOMAN'S AUXILIARY

to the

CALIFORNIA MEDICAL ASSOCIATION

Twentieth Annual Convention, April 30-May 3, 1950

Headquarters: Hotel del Coronado, San Diego, California

MRS. RAYMOND T. WAYLAND
President

MRS. WILLIAM R. MOLONY, JR.
President-Elect

Convention Chairman: MRS. RALEIGH W. BURLINGAME

REGISTRATION

Sunday, April 30—2 to 5 p.m.: Lobby of U. S. Grant Hotel, Hotel Manor, El Cortez Hotel, Hotel San Diego, Hotel del Coronado.

Monday, May 1—9 a.m. to noon, 2 to 5 p.m.: Hotel del Coronado.

Tuesday, May 2—9 a.m. to noon: Hotel del Coronado.

SATURDAY, APRIL 29

8:30 p.m.—Executive Board Meeting, President's Suite, Hotel del Coronado.

SUNDAY, APRIL 30

10:00 a.m.—Opening Session of the California Medical Association. Report by the President of the Woman's Auxiliary, Mrs. Raymond T. Wayland. All members and doctors' wives are invited to attend. Recital Hall, Palisades Building, Balboa Park.

10:30 a.m.—Pre-Convention Board Meeting, Cuarto Nuevo Room, House of Hospitality, Balboa Park.

5:00 p.m.—Buses leave for Fronton Palace, Tijuana, Mexico.

6:00 p.m.—Dinner—Fronton Palace.

7:00 p.m.—Jai Alai Games—Fronton Palace. (Passes provided for Jai Alai games at Registration Desks on Sunday only.)

MONDAY, MAY 1

9:30 a.m.—First General Session of the Twentieth Annual Meeting, Mrs. Raymond T. Wayland, President, presiding. Ballroom, Hotel del Coronado.

12:45 p.m.—Luncheon—Crown Room, Hotel del Coronado, honoring Mrs. Raymond T. Wayland, President, President-Elect, Past State President and Members of the Advisory Council.
Guest Speaker: Mr. Fred Mitchell, President, Constitutional Foundation—Current Events on a National Level.

1:30 p.m.—Golf Tournament for C.M.A. Members. San Diego Golf Club.

7:00 p.m.—California Medical Association Annual Dinner honoring the President—Hotel del Coronado.

TUESDAY, MAY 2

9:30 a.m.—Second General Session of the Twentieth Annual Meeting, Mrs. Raymond T. Wayland, President, presiding. Ballroom, Hotel del Coronado.

4:00-6:00 p.m.—Reception honoring Mrs. R. Stanley Kneeshaw, wife of the President of the California Medical Association. Hotel del Coronado—at pool, weather permitting, otherwise in the Circus Room. All doctors' wives and husbands invited.

Technical Exhibits

The Association is fortunate this year in having suitable space available for all technical exhibits in one area. The ground floor of the Conference Building, where scientific section meetings are to be held, has been arranged in convenient form for the display of products and services for the benefit of the physician.

Scientific exhibits will be displayed on the same floor, and the official Registration Desk is also located there. Members and visitors are reminded that registration badges will be needed to gain admission to the scientific sessions.

Members are also reminded that the technical exhibitors pay the Association for the privilege of displaying their services and products at the Annual Session. Their financial contribution pays the major portion of the large cost of arranging the Annual Session, and all members of the Association owe these exhibitors a debt of gratitude for that reason.

From the scientific point of view, the technical exhibitors will have on display the latest developments in diagnostic and therapeutic aids, instruments, equipment and services. Here, assembled in one place, is a storehouse of information for the busy practitioner. You are urged to visit the exhibits, spend some time with the representatives, register with them and show your appreciation. In return, your time will be fully repaid in the knowledge you can gain in this single display.

About the Exhibitors

ABBOTT LABORATORIES

North Chicago, Illinois **Booths Nos. 62 and 63**

Abbott will feature Desoxyn Hydrochloride (Methamphetamine Hydrochloride, Abbott) and Pentothal Sodium (Sterile Thiopental Sodium, Abbott). Four transparencies illuminated in succession illustrate "smaller dosage, quicker action, longer effect and fewer side-effects" of Desoxyn as a cerebral stimulant, vasopressor agent and adjunct to the management of obesity. Another illuminated display depicts the advantages of Pentothal Sodium as an anesthetic for intravenous use—simplicity of equipment, easy and rapid induction, pleasant recovery period and elimination of fire and explosion hazard.

A. S. ALOE COMPANY Booths Nos. 38 and 39

Los Angeles

Our Federal Communication Commission-approved Short Wave Diatherm, an exceptional line of instruments, including special outstanding buys of government surplus instruments, diagnostic instruments and Allison furniture will be featured in our booths. Limited space permits us to show only a small portion of our line which is comprised of over 30,000 items, including a complete line of laboratory equipment and supplies.

AMES COMPANY, Inc. Booth No. 69

Elkhart, Indiana

The Selftester, a simple home-testing unit for urine-sugar detection, will be featured at the Ames booth. The Selftester was developed in cooperation with the American Diabetes Association to help find and bring the "million unknown diabetics" under physicians' care. It has been accepted for advertising in publications of the American Medical Association.

Clinitest, Acetest, and Hematest, simplified tests for the detection of urine-sugar, acetone bodies, and occult blood, will be demonstrated.

AYERST, McKENNA & HARRISON Ltd.

New York, New York **Booth No. 86**

"Premarin" (Estrogenic Substances — water-soluble) — a highly effective and well-tolerated preparation of naturally-occurring, orally-active, conjugated estrogens (equine). The potency of "Premarin" is expressed in terms of its principal estrogen, sodium estrone sulfate.

"Premarin" provides convenience of administration and flexibility of dosage. Four potencies of "Premarin" tablets are available. "Premarin" is also presented in liquid form.

THE BAKER LABORATORIES, Inc.

Cleveland, Ohio **Booth No. 56**

Starting with Grade A cows' milk as the basis of the formula, Baker's Modified Milk is fortified at seven strategic points to obtain more efficient nutritive action and is adjusted and processed to insure better tolerance. An adjusted protein, two carbohydrates, a modified fat, vitamins, soluble mineral salts and iron, coupled with simplicity of preparation and low cost, provide for complete nutrition and insure cooperation in the home. Baker's Modified Milk, liquid or powder, may be used interchangeably from birth to the end of the formula-feeding period.

DON BAXTER, Inc. Booth No. 99

Glendale

Featured in the exhibit of Don Baxter, Inc., will be several new Vacoliter solutions, including: 0.9 per cent Ammonium Chloride in Saline, or Distilled Water (for treatment of alkalosis); 0.2 per cent Potassium Chloride with 5 per cent Dextrose in Distilled Water (for correction of intracellular potassium deficiency); 0.2 per cent Procaine Hydrochloride in 0.45 per cent Sodium Chloride; and 6 per cent Hyprotigen with 5 per cent Dextrose and 5 per cent Alcohol in Distilled Water, as well as expendable sets for the administration of solutions and blood. Also to be shown are the new low-cost, satin-smooth, nontraumatic K-10 Expendable plastic Levin Tube, and the Baxter Expendable Oxygen Catheter.

THE BORDEN COMPANY Booth No. 19

New York, New York

Spend a few pleasant minutes with Borden at Booth No. 19 and refresh your memory on our Prescription Products. Meet Biolac, a liquid modified milk for infant feeding; Dryco with its high-protein, low-fat content for formula flexibility; Mull-Soy, a liquid hypoallergenic soy food for your milk allergic patients; powdered whole milk Klim, a dependable source of whole milk; Gerilac, a vitamin-fortified powdered milk for well-rounded nutrition; the improved milk sugar, Beta Lactose, for carbohydrate supplementation; and the powdered Merrell-Soule Protein and Lactic Acid Milks for special infant feeding cases.

THE BORDEN COMPANY, Evaporated Milk Div.

New York, New York **Booth No. 102**

An animated replica of Elsie will silently chew her cud for the entertainment of all. Printed material and information on Borden's Evaporated Milk which will be helpful to doctors will be available. Borden's Flavor-Peak Instant Pure Coffee will be served free. Souvenirs will be available.

BOYLE AND COMPANY Booth No. 58

Los Angeles

A. M. BROOKS COMPANY Booth No. 21

Los Angeles

We extend a cordial invitation to you to stop at our booth for examination and demonstration of the Raytheon Microtherm, microwave (radar) diathermy. See for yourself the most outstanding development in diathermy today. Also featuring ADC Microtone-Audiometers with the latest contribution to the field of scientific hearing testing.

Also, Meditherm surgical tissue cutters and Mediquartz ultraviolet lamps.

Capable representatives will be on hand at all times to answer questions on above equipment.

BURROUGHS WELLCOME & COMPANY

Tuckahoe, New York **Booth No. 55**

"B. W. & Co." will feature a completely *new type* antihistaminic "Perazil" brand Chlorcyclizine Hydrochloride. "Perazil" differs chemically in that it is a piperazine rather than a conventional ethylenediamine compound. Ask our representatives about the advantages of "Perazil." We will also feature "Wellcome" brand Globin Insulin, the accepted intermediate acting insulin and Digoxin, for safe, predictable digitalization.

CAMEL CIGARETTES Booths Nos. 59 and 60

New York, New York

Camel Cigarettes will feature color slides of background data from their newest research. After weekly examinations of the throats of hundreds of men and women smoking Camel Cigarettes exclusively for thirty days, throat specialists reported "Not one single case of throat irritation due to smoking Camels."

CAMERON SURGICAL SPECIALTY COMPANY

Chicago, Illinois **Booth No. 101**

See the new Suction Coagulation Handle and numerous accessories for all phases of Electro-Surgery, Electro-Cauterization, Electro-Coagulation, Desiccation and Fulguration; Cameron Surgical Units; Electro-Diagnostic Lamp and Instrument Outfits; the new stainless steel Boros Flexible Esophagoscope and other Peroral Equipment; Coagulair and Dualite Sigmoidoscopes; Tele-Vaginalite; Mirrolite and other Headlights; Binocular Loupes; Illuminated Specula, Endoscopes and Retractors.

ELDON H. CANRIGHT COMPANY Booth No. 76

Glendale

CARNATION COMPANY Booth No. 85

Los Angeles

You are invited to visit the Carnation Company Booth No. 85 where you will see an attractive display presenting some interesting information on the various uses of Carnation Vitamin D Evaporated Milk for infant feeding, child feeding and general diet purposes. The method by which Carnation Milk is generously fortified with Vitamin D—400 U.S.P. units per reconstituted quart—will be explained. Valuable literature will also be available for distribution.

CIBA PHARMACEUTICAL PRODUCTS, Inc.

Summit, New Jersey **Booth No. 44**

Ciba Pharmaceutical Products, Inc., Summit, New Jersey (Booth No. 44), invite you to visit their exhibit for latest information on Priscoline (formerly known as Priscol), a valuable adjunct to the treatment of peripheral vascular disease. Pyribenzamine, HCl, the antihistaminic drug for prevention and relief of anaphylaxis and many forms of allergy, will also be featured.

Representatives in attendance will gladly answer any questions about these and other Ciba products.

THE COCA-COLA COMPANY Booth No. 104

Atlanta, Georgia

Ice-cold Coca-Cola served through the cooperation and courtesy of the Coca-Cola Bottling Company of San Diego, and the Coca-Cola Company.

CONTINENTAL MEDICAL BUREAU

Los Angeles **Booth No. 57**

The Continental Medical Bureau of Los Angeles (Helen Buchan, Director) will have representatives in Booth 57. This Bureau offers a complete service to the medical profession.

If you seek an assistant or associate in your offices or a Specialist for a Group it will be worth your while to stop and discuss your needs with this Bureau. Locations are checked for private practice: Hospitals, clinics, office-residences and established practices are listed for sale. Complete brochures will be on hand for your review.

Leave orders here also for qualified personnel for hospitals and doctors' offices. Confidential services; information gladly.

CUTTER LABORATORIES Booth No. 84

Berkeley

Cutter Laboratories will display their complete line of human products—the only company in the world that manufactures a complete line of human biologicals, human blood fractions, penicillin products, and intravenous solutions in Safti-flasks.

All the new improved pediatric products purified in our own blood fractions laboratories will be on display. The new purification method gives less reaction with higher immunity with only ½ cc. dosage.

The complete line of human blood fractions, including Immune Serum Globulin, Hypertussis, Albumin, Fibrin Foam and Thrombin, Normal Human Dried Irradiated Plasma, and Thrombin will be available.

Too, you will see a complete line of Cutter Intravenous Solutions and the latest techniques for administration.

F. A. DAVIS COMPANY Booth No. 74

Philadelphia, Pennsylvania

For seventy years the F. A. Davis Company has continuously served the medical and nursing professions everywhere with standard up-to-date text and reference books. Be sure to see the *Cyclopedia of Medicine, Surgery and Specialties*, Reimann's *Treatment in General Medicine*, Litchfield-Dembo's *Therapeutics of Infancy and Childhood*, Pillmore's *Clinical Radiology*, Stroud's *Cardiovascular Disease*, Troncoso's *Internal Diseases of the Eye*, McCrea's *Clinical Cystoscopy*, May's *Reparative and Reconstructive Surgery*, Goldberg's *Clinical Tuberculosis*, Alpers' *Clinical Neurology*, Loewenberg's *Medical and*

Physical Diagnosis, Greenbaum's *Dermatology*, Lederer's *Diseases of the Ear, Nose and Throat*, Goodale's *Clinical Interpretations of Laboratory Tests*, and Judovich-Bates' *Pain Syndromes.*

DESITIN CHEMICAL COMPANY Booth No. 66

Providence, Rhode Island

Desitin Ointment, the pioneer in external cod liver oil therapy, combines crude high potency Norwegian cod liver oil, zinc oxide, talcum, in a lanolin petrolatum base. Because of its well-balanced and standardized crude cod liver oil Desitin Ointment alleviates pain and relieves itching promptly. It promotes granulation and epithelization. Desitin Ointment is not liquefied at body temperature nor decomposed by secretions.

Indications: Postoperative dressings, slow healing wounds, indulate varicose ulcers, burns of all degrees, lacerations, bed sores, diaper rash and fissures.

Desitin Powder is a unique, medicinal toilet powder. It contains Norwegian cod liver oil, zinc oxide, talc and magnesium oxide.

Uses: As of Desitin Ointment.

DEVEREUX RANCH SCHOOL Booth No. 65

Santa Barbara

Devereux Schools provide the physician with facilities for the education and treatment of children having academic or emotional difficulties. Twelve Devereux Schools in Pennsylvania, as well as the Devereux Ranch School in California, offer a controlled environment and modern training shaped to the needs of each child. At Santa Barbara, the 350-acre ranch school bordering on the Pacific Ocean has an enrollment of seventy children. In Pennsylvania, there are facilities for over 400 students. Representatives at the booth will gladly answer questions or discuss how Devereux may serve you and your patients.

THE DIETENE COMPANY Booth No. 29

Minneapolis, Minnesota

Visit our exhibit and examine the Free Diet Service for physicians. The diets are nutritionally well-balanced, easy to follow and made to appear as if they were typed in your office.

Meritene, the economical and palatable whole protein supplement, and Dietene, the "Council-accepted" reducing supplement, will be on display.

DOHO CHEMICAL CORPORATION

New York, New York **Booth No. 92**

The Doho Chemical Corporation and its subsidiary, Mallon Chemical Corporation, makers of Auralgan, O-*tos*-mosan and Rectalgan, are proud to announce their new nasal decongestant, Rhinalgan—a balanced formulation of two active chemical compounds that gives prolonged vasoconstriction—used as a spray, in our patented Dohony Spraymist atomizer—pleasant tasting, with no systemic effect (pressor or respiratory), and can be safely used for infants and children.

Our representatives are anxious to explain the merits of Rhinalgan and distribute samples of this innovation.

EATON LABORATORIES, Inc. Booth No. 18

Norwich, New York

Recent specialties include the latest additions to the Furacin Family: Furacin Anhydrous Ear Solution which has proven effective in many cases of bacterial otitis media et externa which had proved refractory to all other medicaments, and Furacin Vaginal Suppositories for bacterial cervicitis and vaginitis and pre- and postoperative vaginal surgery.

Tripazine—triple sulfa' tablet of closely related sulfonamides to minimize crystalluria; Aspogen—the aluminum-amino acid salt with prompt and prolonged action for treatment of peptic ulcer; Paracin—scabicide, pediculicide and ovicide, antipruritic and effective in one application.

Results of recent clinical studies of the efficacy of Lorophyn Suppositories will be available.

ENDO PRODUCTS, Inc. Booth No. 89

Richmond Hill, New York

Endo Products will exhibit and sample some of its many A.M.A. Council-accepted items such as: Hycodan, Mesopin Tablets and Elixir, Norodin and our Water-soluble Polyvitamin drops. Our representatives will be on hand to discuss newly released products with our many friends in the medical profession.

C. B. FLEET COMPANY, Inc. Booth No. 53

Lynchburg, Virginia

C. B. Fleet Company, Inc., cordially invites you to stop at Booth No. 53 to see the exhibit of Phospho-Soda (Fleet). Phospho-Soda (Fleet) is a solution containing in each 100 cc. sodium biphosphate 48 gm. and sodium phosphate 18 gm. Phospho-Soda (Fleet), over the years has won discriminating preference by thousands of physicians—because of its controlled action . . . its freedom from undesirable side-effect, and its ease of administration.

There is only *one* Phospho-Soda (Fleet).

ROLAND J. GAUPEL COMPANY Booth No. 11

Los Angeles

Exhibit will contain Profexray X-ray machines and accessory items, consisting of the TX-2 Superficial Therapy X-ray unit, Combination radiographic and fluoroscopic unit, and the Mobile unit. Have simplicity of design; versatile in function, complete ease of operation and mechanical reliability.

Also the Roentgen Ray Film Dryer, Underwriters Laboratories approved. Average drying time with heater, 12-15 minutes; without heater, 20-30 minutes.

GENERAL ELECTRIC X-RAY CORPORATION

Los Angeles **Booth No. 100**

Featuring the new Maxicon line—permits you to choose only the x-ray facilities that you require from the simplest to the most complete unit. Comprised of a number of components that can be assembled in varied combinations, it covers a range of diagnostic x-ray apparatus from the horizontal x-ray table to the 200 milliampere, two-tube motor driven combination unit. All are acquired by the mere addition of the necessary components to a basic unit.

GERBER PRODUCTS COMPANY Booth No. 80

Oakland

Is it baby feeding or babying adults' alimentary tracts? Either or both—we can serve you with a *complete* line of good-to-eat Strained and Junior Foods *plus* new editions of baby care books. The 1950 Special Diet Recipes is nutritionist-edited for smooth diet simplification and palatability. We are on the exhibit floor to greet you.

OTIS E. GLIDDEN & CO., Inc. Booth No. 51

Evanston, Illinois

Visit the Zymenol exhibit and receive, no charge, a $1.25 size bottle of Zymenol to convince yourself by personal or family trial that Zymenol, an emulsion with brewers yeast, is an effective bowel management without habit-forming irritation, distention, purgation or lubrication.

GOLDEN STATE COMPANY, Ltd. **Booth No. 42**
San Francisco

JOHN F. GREER COMPANY **Booth No. 68**
Oakland

The John F. Greer Company has a completely new line of Ileostomy and Colostomy equipment to introduce to the doctors this year.

The Ileostomy equipment is of Neoprene and is designed for night wear as well as day. A special gum cements the appliance to the body for efficient contact.

The new "Greer Colostomy Compact" will be a delight to the patient who travels, as well as the busy person who is seeking easy-to-clean equipment.

THE HARROWER LABORATORY, Inc.
Glendale **Booth No. 87**

The Harrower exhibit has three main points of interest: (1) Gastroscopic pictures illustrating the coating action of Mucotin, the "Council Accepted" mucin antacid. (2) Schematic presentation of the physiological action of Prulose, a corrective laxative. (3) The role of the Krebs Cycle and Hematocrin in energy metabolism is graphically shown. Reprints and samples will be available at the booth.

H. J. HEINZ COMPANY **Booth No. 47**
Pittsburgh, Pennsylvania

H. J. Heinz will be displaying strained and junior foods as well as their wide variety of nutrition material. Doctors will find the products of interest not only for the feeding of babies and other small children, but for the feeding in gastrointestinal cases, pre- and postoperative disturbances, oral troubles, geriatrics, and a number of conditions where strained and junior foods are required.

HOFFMANN-LA ROCHE, Inc. **Booth No. 93**
Nutley, New Jersey

Roche will feature its antihistamin, Thephorin, which is distinguished by relative freedom from drowsiness. Roche will also feature Thephorin Ointment, a superior antipruritic containing 5 per cent of Thephorin; Thephorin Lotion, an emollient preparation containing 5 per cent Thephorin, indicated in allergic skin disorders; and Thephorin-AC, a tablet containing Thephorin, acetophenetidin, aspirin and caffeine, indicated for aborting and treating the common cold.

Stop at the Roche booth where representatives will be in attendance to discuss these and other Roche products of interest to the physician.

HOLLAND-RANTOS COMPANY, Inc.
New York, New York **Booth No. 77**

Plan to visit the Holland-Rantos exhibit, featuring latest developments in Koromex contraceptive specialties. Inspect the various combination sets, each one of which meets a particular need in the doctor's practice. Investigate how Koromex Sets—without added cost—enable patients to determine individual preference for jelly or equally-effective but less-lubricating cream. See the convenient, permanent plastic container for Koromex Diaphragm Fitting Rings.

LANTEEN MEDICAL LABORATORIES, Inc.
Evanston, Illinois **Booth No. 25**

Lanteen Medical Laboratories, Inc., extend a cordial invitation to visit their Space No. 25. Representatives will be happy to discuss an improved contraceptive technique. All of the well-known Lanteen products will be available for discussion.

LEDERLE LABORATORIES **Booth No. 96**
New York, New York

You are cordially invited to visit our exhibit in Booth No. 96, where you will find representatives who are prepared to give you the latest information on Lederle products.

THE LIEBEL-FLARSHEIM COMPANY
Cincinnati, Ohio **Booth No. 33**

The Liebel-Flarsheim Company cordially invites you to visit Booth No. 33 in which their latest diathermy and Bovie electrosurgical apparatus will be available for examination and demonstration. This year's exhibit features the "Office Bovie," an electrosurgical unit specially designed for office use. Capable representatives will be on hand at all times and we hope you will stop by so that we may become acquainted.

ELI LILLY AND COMPANY **Booth No. 40**
Indianapolis, Indiana

Your Lilly medical service representative cordially invites you to visit the Lilly exhibit located in Space No. 40. The display for 1950 features a presentation on the incidence and potential number of diabetics in America. The attending representatives will be pleased indeed to assist visiting physicians in every way possible.

J. B. LIPPINCOTT COMPANY **Booth No. 43**
Philadelphia, Pennsylvania

J. B. Lippincott Company presents an interesting and active exhibit of professional publishing. With the "pulse of practice" centering in an advisory editorial board of active clinicians who constantly review the field, current and coming trends in medicine and surgery are known continually. On the studied recommendations of these medical leaders, Lippincott Selected Professional Books are undertaken. It is upon their knowledge, too, of the outstanding work being done in general practice, as well as the specialties, that men making a very real contribution to medical progress are chosen to author the Lippincott books.

LOV-É BRASSIERE COMPANY **Booth No. 2**
Hollywood

Lov-é Brassiere Company, Hollywood, invites you to inspect our highly specialized line of therapeutic breast supports. These scientific brassieres enable the physician to prescribe remedial supports for specific breast conditions. Each Lov-é Brassiere is custom-fitted inch-by-inch to your patient's personal measurement . . . and in exact accordance with your instructions. Lov-é Corrective Brassieres are available in leading department stores and fine corset shops throughout the West. Eighteen models in more than 500 bust-cup-torso size variations. Special brassieres for prenatal, postpartum, atrophic, hypertrophic and mastectomy. Also available: Sleeping brassieres, hospital binders, artificial breasts, anatomically designed muscle pads and maternity garter supports. Our representative will be very pleased to see you and happy to answer any questions you may have in reference to the Lov-é line.

M & R DIETETIC LABORATORIES, Inc.
Columbus, Ohio **Booth No. 9**

Similac Division, M & R Dietetic Laboratories, Inc., Booth No. 9, will display Similac, a food for infants, and Cerevim, a cereal food. Our representatives will appreciate the opportunity to discuss the merit and suggested application for both the normal and special feeding cases.

MARLYN CO., Inc. Booth No. 22

Los Angeles

Cordially invite you to visit Booth No. 22. New concepts in Endocrine Therapy will be featured, and literature on these products will be available. Marlyn's medical service representatives are to be in attendance to aid physicians in every way possible.

MEAD JOHNSON AND COMPANY

Evansville, Indiana **Booth No. 88**

Poly-vi-sol, Tri-vi-sol, Ce-vi-sol, Dextri-Maltose, Oleum Percomorphum, Pablum, Pabena, Olac and other Mead Products used in Infant Nutrition will be on display at the Mead Johnson exhibit at your California Medical Association meeting. Protenum, a new high protein product, will be displayed. Also, Lonalac, for low sodium diets. Our representatives at the exhibit will be glad to discuss with you the new improvements of Amigen and Amisets.

MEDICAL CENTER AGENCY Booth No. 97

San Francisco

If you are looking for an associate or an association let the West's foremost medical placement service—The Medical Center Agency—help you.

The Medical Center offers long experience in filling the needs of physicians seeking professional affiliation and it enjoys an unmatched reputation in this special field.

The center of placement activity for physicians and all other medical personnel. Our director, Norma S. Rohl, will be at the booth to assist you.

THE MEDICAL PROTECTIVE COMPANY

Fort Wayne, Indiana **Booth No. 6**

The Medical Protective Company is represented at Booth No. 6 where you are invited to call.

Our representative is at your service to present our Protection Plan, to explain the peculiar relation of the doctor to the law which governs your protection or to discuss any particular phase of Professional Liability in which you are especially interested.

MERCK & CO., Inc. Booth No. 30

Rahway, New Jersey

Merck & Co., Inc., features the new diagnostic agent Benodaine,* of value for detecting hypertension caused by the presence of an epinephrine-producing tumor (pheochromocytoma). The antihistaminic agent Neo-Antergan® also will be featured. Neo-Antergan is advertised to the medical profession exclusively. Other Merck products on display include Urecholine® for relieving urinary retention, gastric retention, and abdominal distention; Cobione® (Crystalline Vitamin B_{12} Merck) for the treatment of megaloblastic anemias; and PAS (Para-Aminosalicylic Acid Merck) for complementing streptomycin and dihydrostreptomycin in tuberculosis therapy.

* "Benodaine" is the trade-mark of Merck & Co., Inc., for its brand of piperoxane.

THE Wm. S. MERRELL COMPANY

Cincinnati, Ohio **Booth No. 10**

"Its Name Is Nethaphyl" identifies Merrell's new drug for prompt symptomatic relief of bronchial asthma. In eight years of clinical experience, Nethaphyl has proven effective in 85 to 90 per cent of the cases. Combining a more effective bronchodilator, a better tolerated myocardial stimulant and a mild sedative, it has demonstrated essential freedom from central stimulation or other side effects, effectiveness in epinephrine-fast patients, no increased tolerance or urinary retention, and non-interference with desensitization therapy. In one study, 87 per cent of patients preferred Nethaphyl over other drugs. Merrell representatives will gladly discuss its action and give you samples for clinical trial.

E. S. MILLER LABORATORIES, Inc.

Los Angeles **Booth No. 81**

The E. S. Miller Laboratories, one of California's oldest ethical pharmaceutical manufacturers, will exhibit at Booth No. 81. A complete line of ampuls, tablets and capsules will be shown; especially featured will be their hormone products.

MILLER SURGICAL COMPANY Booth No. 61

Chicago, Illinois

Miller Surgical Company—manufacturers of diagnostic specialties for diagnosis and treatment of the body orifices and cavities with direct magnification and shadow-free illumination. Also displaying the Miller rectal diagnostic set for diagnosis, treatment and surgery, designed by Rudolph V. Gorsch, M.D.

THE C. V. MOSBY COMPANY Booth No. 7

St. Louis, Missouri

The C. V. Mosby Company of California will have available, at its exhibit Booth No. 7, a fine list in medical and surgical books. Books on the medical and surgical specialties will be there as well, to be looked over at the leisure of those who may be interested.

Similarly the copies of the excellent journals published by the Mosby Company will also be available.

NATIONAL DRUG COMPANY Booth No. 94

New York, N. Y.

THE NESTLÉ COMPANY, Inc. Booth No. 72

New York, New York

The Nestlé Company, Inc., New York, cordially invites you to visit their exhibit where specially qualified representatives will be on hand to answer your questions on any of Nestlé's milk products—already best known and most used for babies round the world.

THE NETTLESHIP COMPANY Booth No. 98

Los Angeles

The Nettleship Company of Los Angeles, Malpractice Insurance Specialists, Administrators of Official Malpractice (also Group Accident and Health) insurance programs for L.A.C.M.A., Santa Barbara, Kern, Tulare and Orange County Societies. Serving the healing profession since 1925. Specimen consent and authority forms available for convention attendants.

ORTHO PHARMACEUTICAL CORPORATION

Raritan, New Jersey **Booth No. 103**

Ortho will exhibit its complete line of gynecic pharmaceuticals, featuring Masse for pre- and postnatal breast care, Triple Sulfa cream for bacterial Vaginitis; also the Ortho Kit and Ortho White Diaphragm for control of conception.

PACIFIC COAST MEDICAL BUREAU

San Francisco **Booth No. 15**

The Pacific Coast Medical Bureau of San Francisco will be represented in Booth No. 15 by Maria Gizzi and Lois Weaver.

Complete information on locations needing doctors, opportunities with groups, assistantships or associations will be available in this booth.

Our personnel consultation service also assures you of a select list of efficient office and hospital personnel who are available for immediate placement.

Established six years in San Francisco.

PARKE, DAVIS & CO. Booth No. 48

Detroit, Michigan

Members of the Parke, Davis & Company Medical Service Staff will be on hand at our Commercial Exhibit for consultation and general discussion of the products classified in our Pharmaceutic, Antibiotic, and Biologic lines. Important specialties, such as Chloromycetin, Penicillin S-R, Benadryl group, Vitamin Products, Antibiotics, Oxycel, Thrombin Topical, Influenza Virus Vaccine, and other biologics will be featured. You are cordially invited to visit our booth with the assurance that your interest will indeed be very much appreciated.

PELTON AND CRANE COMPANY

Detroit, Michigan **Booth No. 35**

Pelton and Crane will exhibit in Booth No. 35 their latest sterilizers. They will have on display their small instrument sterilizers as well as their larger autoclaves and cabinet sterilizers. Competent representatives will gladly assist you in selecting the proper equipment for your office or hospital.

PET MILK COMPANY Booths Nos. 78 and 79

San Francisco

You are invited to visit our Booths Nos. 78 and 79 in which we will display a Pet Milk plant in working miniature. This miniature plant has been displayed at many of the large medical meetings held throughout the United States. Competent men will be on hand to explain the processing of Pet Milk and many of our services to the physician will be available. Each person visiting our booths will receive a miniature Pet Milk can.

PHILIP MORRIS & COMPANY Ltd. Inc.

New York, New York **Booth No. 27**

Philip Morris and Company will show the results of research on the irritant effects of cigarette smoke. These results will show conclusively that Philip Morris are less irritating than other cigarettes. An interesting demonstration will be made on smokers at the exhibit which will show the difference in cigarettes.

PICKER X-RAY Booth No. 91

Los Angeles

Display will be the new Picker 60 MA Meteor. This unit is a combination radiographic and fluoroscopic unit designed specifically for the general practitioner. The table, when not being used for x-ray purposes, can be used as a regular examining table.

RADIUM CHEMICAL COMPANY, Inc.

Los Angeles **Booth No. 45**

The Radium Chemical Company, Incorporated, will have on exhibit at its booth the latest type radium and radon applicators and accessories.

Mr. Charles F. Bergesch, their western representative, will be in attendance to discuss the radium and radon services afforded West Coast physicians from their new Los Angeles office.

A. H. ROBINS COMPANY, Inc. Booth No. 95

Richmond, Virginia

The A. H. Robins Company display is featuring the sedative-antispasmodic, Donnatal; the antirheumatic, Pablate; Entozyme, digestant with the unique "Peptomatic" action; and the newly introduced antitussive-expectorant, Robitussin. Robins' Medical Service representatives will welcome the privilege of discussing with physicians attending the assembly these and other products in the company's line of prescription specialties.

J. B. ROERIG AND COMPANY Booth No. 16

Chicago, Illinois

All Roerig preparations will be displayed against a backboard featuring Roerig's newest Rx preparation, Viterra. You are cordially invited to stop by our booth and visit with our representatives.

SANBORN COMPANY Booth No. 34

Cambridge, Massachusetts

Featured at the Booth No. 34 will be the new Sanborn Electrophrenic Respirator, a device for securing artificial respiration by controlled electrical stimulation of the phrenic nerve.

For the clinician, there will be demonstrations of the Viso-Cardiette, the direct-writing eletrocardiograph; the photographic Instomatic Cardiette; and the Metabulator, latest model Sanborn metabolism tester.

And for the research-and-teaching physicians, actual instruments or complete data will be available concerning the Poly-Viso (multi-channel biophysical research recorder), the Electromanometer (for pressure recordings), and other new Sanborn instruments for cardiac and other research, teaching, and diagnosis.

SANDOZ PHARMACEUTICALS Booth No. 1

San Francisco

This display will feature Cafergot (Cafergone), for the oral treatment of migraine and other types of headache, D.H.E. 45 (Dihydroergotamine) for the parenteral treatment of migraine, Mesantoin and Hydantal, for the treatment of epilepsy, Methergine, an oxytocic, and several cardiac glycosides including Cedilanid, Digilanid and Strophosid.

Well-informed attendants will be present to answer all inquiries and to discuss new products to be released in the near future.

W. B. SAUNDERS COMPANY Booth No. 90

Philadelphia, Pennsylvania

We invite the doctors attending the meeting of the California Medical Association to visit our exhibit where Mr. Keith Chrysler will display a complete line of our books including Hyman's *Integrated Practice of Medicine*, Bockus' *Postgraduate Gastro-enterology*, *Cytologic Diagnosis of Cancer*, Wells' *Clinical Pathology*, Wolff's *Electro-Cardiography*, Hauser's *Diseases of the Foot*, Nesselrod's *Proctology*, Custer's *Atlas of Blood and Bone Marrow*, Sunderman and Boerner's *Normal Clinical Values*, Friedberg's *Diseases of the Heart*, Dry's *Cardiology*, Janney's *Medical Gynecology*, Levine and Harvey's *Clinical Auscultation of the Heart*, Boies' *Otolaryngology*, Conn's *1950 Current Therapy*, Mitchell-Nelson's *Pediatrics*, and many other new books and new editions.

SCHENLEY LABORATORIES, Inc. Booth No. 13

New York, New York

Attending physicians are cordially invited to visit the Schenley Laboratories' booth. The exhibit features Titralac, an extremely palatable antacid with a titration curve similar to that of milk; Rutaminal, combining rutin, aminophylline, and phenobarbital for protection in certain cardiovascular disorders and diabetic retinopathies; Pelvicins, 200,000-unit penicillin vaginal suppositories; Penesthettes, penicillin lozenges with benzocaine; and Sedamyl, a reliable sedative with a calming yet non-hypnotic action. Qualified personnel will be present to furnish full details of these and other Schenley products.

R. L. SCHERER COMPANY Booth No. 24

Los Angeles

We will display Mattern x-ray equipment, the new Burdick electrocardiograph, diagnostic instruments and other equipment of general interest to the doctor.

SCHERING CORPORATION — Booth No. 5

Bloomfield, New Jersey

Buccal tablets of Oreton, Progynon, Proluton, and Cortate with the exclusively new base, Polyhydrol, will be featured at the Schering exhibit. Polyhydrol makes possible complete absorption of hormones via the buccal route providing advantages of high effectiveness, convenience, and economy. Trimeton and Chlor-Trimeton, two outstanding antihistamines, and Coricidin, Schering's new treatment for the common cold, containing Chlor-Trimeton, aspirin, phenacetin, and caffeine, will highlight the exhibit.

Schering representatives will be present to welcome you, and will be happy to answer inquiries concerning Schering's new products as well as their other hormone, x-ray diagnostic, chemotherapeutic, and pharmaceutical specialties.

G. D. SEARLE & CO. — Booth No. 8

Chicago, Illinois

You are cordially invited to visit the Searle booth where our representatives will be happy to answer any questions regarding Searle Products of Research.

Featured will be Dramamine for the prevention and active treatment of motion sickness; Alidase, for hypodermoclysis; Ruphyllin, for abnormal capillary fragility; Hydryllin, new and effective antihistaminic, as well as such time-proven products as Searle Aminophyllin in all dosage forms, Metamucil, Ketochol, Floraquin, Kiophyllin, Diodoquin, Pavatrine, and Pavatrine with Phenobarbital.

SHARP & DOHME — Booth No. 31

Philadelphia, Pennsylvania

Visitors attending the California Medical Association meeting are cordially invited to visit the Sharp & Dohme exhibit in Booth No. 31. Stable, portable "Lyovac" Normal Human Plasma, irradiated to destroy viral contaminants that might cause homologous serum hepatitis, merits your attention. Unusual specialties including "Cremo"-sulfonamides, pleasantly flavored, palatable suspensions of the most effective systemic and enteric sulfonamides, and "Delmor," a delicious nutrient powder, also will be of major interest.

SICULAR X-RAY — Booth No. 91

San Francisco

Display will be the new Picker 60MA Meteor. This unit is a combination radiographic and fluoroscopic unit designed specifically for the general practitioner. The table, when not being used for x-ray purposes, can be used as a regular examining table.

THE SMITH-DORSEY COMPANY — Booth No. 49

Lincoln, Nebraska

Smith-Dorsey extends a cordial invitation to all doctors to visit their booth. Their new antihistaminics will be featured together with a new para-aminobenzoic acid combination and Vitamin B_{12} (crystalline). Injectable preparations will also be featured and you are welcome to make the Dorsey booth your headquarters during the meeting.

SMITH, KLINE & FRENCH LABORATORIES

Philadelphia, Pennsylvania — **Booth No. 73**

"Dexamyl" — S.K.F.'s balanced combination of "Dexedrine" Sulfate (dextro-amphetamine sulfate, S.K.F.) and "Amytal" (Amobarbital, Lilly) is a new preparation of wide usefulness in everyday practice. Combined in "Dexamyl," "Dexedrine" and "Amytal" work together to provide symptomatic relief from mental and emotional distress.

E. R. SQUIBB & SONS — Booth No. 50

New York, New York

Squibb will feature service material in various fields of therapy at the 1950 Annual Session of the California Medical Association.

Monographs on therapy and practical aids will be available for your perusal from which you may select informative items to fill your particular need.

Come and browse in the Squibb booth!

J. W. STACEY, Inc. — Booth No. 32

San Francisco

Stacey's, established over a quarter of a century ago by members of the medical profession, provides the doctor in the West a single, efficient source for all medical books of all publishers. At Booth No. 32 you will find a composite display of the latest titles in medicine, surgery and the specialties. You are cordially invited to browse.

THE STUART COMPANY — Booth No. 12

Pasadena

The Stuart Formula, liquid and tablet, multiple vitamin and iron therapy at maintenance level. The Stuart Therapeutic Multivitamin, multiple vitamin therapy at the therapeutic level. The Stuart Therapeutic B Complex, C, water-soluble vitamin therapy at the therapeutic level. The Stuart Hematinic, iron, copper, B complex and C, therapy at therapeutic level. The Stuart Hematinic with folic acid. The Stuart Hematinic Liquid. The Stuart Lyophilated Multivitamin Drops, especially suitable for children. Stuart products can help simplify nutritional prescriptions. Remember—the name Stuart and the therapy needed. We hope you will visit the Stuart exhibit.

UNITED LABORATORIES, Ltd. — Booth No. 70

Pasadena

Display of latest ethical pharmaceutical products, including endocrine, vitamin and chemical therapeutic agents.

U. S. VITAMIN CORPORATION — Booth No. 46

New York, New York

Exhibit demonstrates the greatest vitamin technicological advance of the present decade—"oil-in-water" multivitamin solutions — includes Vi-Syneral Injectable which makes available, for the first time in pharmaceutical history, an aqueous parenteral multivitamin solution, ready for immediate injection; also, the original oral aqueous multivitamin formula, Vi-Syneral Vitamin Drops—since 1943.

THE UPJOHN COMPANY — Booth No. 54

Kalamazoo, Michigan

The Upjohn exhibit will present the anticoagulant family: Heparin, Depo-Heparin, and Dicumarol, with particular emphasis placed upon Depo-Heparin.

When heparin is prepared in a gelatin vehicle (Depo-Heparin) and administered intramuscularly, markedly prolonged effects are obtained. A single injection of 1 cc. (200 mg.) of Depo-Heparin will prolong the blood coagulation time for about 24 hours.

WALKER VITAMIN PRODUCTS, Inc.

Mount Vernon, New York — **Booth No. 37**

Precalcin, the complete prenatal product supplying all essential vitamins and minerals, will be featured at this exhibit. Precalcin is unique in that the capsules contain a dry powder fill with no fish liver oils, thereby providing excellent tolerance and patient appeal.

Other featured products include Cevex (Council Accepted Vitamin C Drops), Histacin (cold therapy) and Neodrops (water miscible multivitamins). Other vitamin and amino acid products will also be displayed and representatives present will be glad to discuss all aspects of current therapy in these fields.

WALTERS SURGICAL COMPANY

Los Angeles **Booth No. 36**

H. G. Fischer & Company's latest Space Saver X-Ray Unit and F.C.C. approved Diathermy.

Electro Physical Laboratories Direct Writing Electro Cardiograph.

Latest general surgical supplies.

WESTERN SURGICAL SUPPLY COMPANY

Los Angeles **Booths Nos. 3 and 4**

Complete display of Physician's Furniture, Laboratory Supplies, Physiotherapy Equipment, Sterilizers, Instruments, X-Ray Supplies and Pharmaceuticals.

WESTWOOD PHARMACEUTICALS

Buffalo, New York **Booth No. 20**

Lowila Cake. Lowila Liquid—Non-allergic soap substitute. Completely soapless, non-irritant detergents. Westhiazole Vaginal—single dose disposable applicators for vaginitis and cervicitis.

WHITE LABORATORIES, Inc. **Booth No. 67**

Newark, New Jersey

White Laboratories will have on display Drop-cillin, oral penicillin in drops, and Dram-cillin, oral penicillin by teaspoonful. Both potent, palatable and convenient. Courteous medical service representatives in attendance will be happy to answer all questions and inquiries.

WINTHROP-STEARNS, Inc. **Booth No. 75**

New York, New York

Exhibit and technical information on pharmaceuticals for the medical profession. Featured products will be Demerol, Zephiran, Parenamine, Neosynephrin, Pontocaine, Cartose and pH isoderm with Hexachlorophene.

Technically trained representatives will be present for discussion of the aforementioned products as well as others designed for specialists in the fields of anesthesiology, urology, ophthalmology, internal medicine, allergy and tropical medicine.

We cordially invite you to visit our booth.

WYETH, Incorporated **Booth No. 23**

Philadelphia, Pennsylvania

Neohetramine—the least toxic of the antihistaminics, and Membrettes, buccal tablets of various sex hormones for sublingual absorption, will be featured along with such widely prescribed ethical specialties as Amphojel, Kaomagna with Pectin, Petrogalar, Meonine, Basaljel, and SMA. Trained representatives will be hand to supply literature and samples of many outstanding therapeutic agents.

~

PRE-CONVENTION REPORTS

Officers - Councilors - Committees - County Societies

REPORTS OF GENERAL OFFICERS

REPORT OF THE PRESIDENT

To the Members of the California Medical Association and the House of Delegates:

The year 1949 has passed and 1950 is upon us, yet the road has not been cleared so that the medical profession can delegate all of its time to medical care. The Social Welfare planners, with all their give-away programs, have lulled the politican to sleep and have left him very vulnerable to their welfare schemes.

After all these months of bickering, the head of the F.S.A. comes back from six weeks' travel in Europe and calmly announces that the British system is not applicable to the United States, but states that Mr. Truman's plan is.

This year has seen the intrusion of the police state into our lives. The F.B.I., under orders but without cause, come snooping around to see if they can find a case against the medical profession—the profession that has developed one of the best medical care programs of any country and has given the people of the U.S.A. good medical care.

Let us here in California not be too comforted by our successes against the social trend. We must not feel too secure. Let us be alert to the problem and continue to give good medical care to the people in California so we cannot be criticized.

This year I have visited many of the County Medical Societies. I have attended many meetings of allied groups, such as the Hospital Association, Nurses' Convention, cancer refresher courses, rural health conferences, Grange meetings and the like—trying to get them to see our side of this big program. We need to ally many groups with us in this fight to stem the tide of the welfare state.

I have attended all the Council meetings and have attempted to perform my duties as your President. May I take this opportunity to thank the members of committees who have so faithfully performed their duties. May I thank the members of the Council for their many strenuous hours spent in behalf of the members of the C.M.A. It is a hard, thankless job unless it can be appreciated by you members.

It is my hope that we may continue our leadership along these lines and gain the allies we need to retain this United States of ours in that group where free enterprise still exists.

Respectfully submitted,

R. Stanley Kneeshaw, *President*

REPORT OF THE PRESIDENT-ELECT

To the President and the House of Delegates:

Your President-Elect has been able to fill many engagements contacting lay groups in the interest of our association—Chamber of Commerce committees, labor gatherings, large professional associations, P.T.A., and church groups as well as political gatherings. It has been a great satisfaction to realize that our association has such strong participation and support of our members as shown by the increasing efficiency of our speakers' bureaus.

I believe that the latent political strength of doctors is becoming more kinetic, more effective, almost by the passage of each month, and I am looking forward to the strongest political showing we have ever made in the next election year. More and more doctors are joining chambers of commerce and taking active part in new committees organized to combat socialistic tendencies in various community groups, and it is good to see that leaders in our component societies are out in the front ranks.

I have attended all but one of our Council meetings and all Executive Committee meetings, have served as your delegate to all A.M.A. conventions, and served as trustee of California Physicians Service. Here I wish to congratulate the C.M.A. on the caliber of its council and committee members. Having been off the council for several years, it is indeed reassuring to return to find increased stature, vigor and efficiency, unselfish devotion of time far beyond what could reasonably be expected.

Respectfully submitted,

Donald Cass, *President-Elect*

REPORT OF THE SPEAKER OF THE HOUSE OF DELEGATES

To the President and the House of Delegates:

The report of the Speaker could be presented in one brief sentence: He has attended all meetings of the Council, all meetings but one of the Executive Committee, and has attempted so far as it within him lies possible to carry out faithfully, energetically, and intelligently the special assignments given him.

Beneath the mere mechanics of a vital, successful, and constructive organization lies the fundamental philosophy of its members. During the past year, more than ever before, every member of the medical profession has been called upon to scrutinize most carefully his own concepts of the science and art he practices, to determine the intimate relationships between that art and science and other phases of our modern economic and social structure, to reject outmoded ideas and practices and to accept new economic therapies just as he adopts advances in his own art so long as those new therapies demonstrably rest upon proved basic principles.

Now, more than ever before, members of the California Medical Association are participating actively on boards and committees of chambers of commerce, luncheon clubs, churches, lodges, and other cultural and civic organizations. Their activities are beginning to bear fruit in a widespread recognition that medicine's opposition to political control is something deeper, more fundamental, and far more comprehensive and constructive than the narrow petty self-interest of one group pitting itself against its fellows in sordid competition for the consumer's dollar. These grass-roots public relations activities of every member are of incalculable value in our broad general program against misinformation, misrepresentation, and misunderstanding.

By order of the House of Delegates at its last regular session, the Association has launched a new activity to help overcome the almost unbelievable damage wrought upon our students by the barrage of economic fallacies and social errors to which they have been subjected in their academic days on the college campus. An editorial committee appointed by President Kneeshaw has set energetically to work upon the preparation of a brochure to appear at regular intervals in which some of the basic principles of economics will be presented, their application to the American system of private enterprise explained, and their particular relationship to the practice of medicine emphasized. This is a most commendable objective and deserves our wholehearted support.

Respectfully submitted,
L. A. Alesen, *Speaker*

REPORT OF THE VICE-SPEAKER

To the President and the House of Delegates:

The Vice-Speaker has attended the meetings of the Council and has carried out such assignments as have been delegated by the Council and its officers.

Respectfully submitted,
Donald A. Charnock, *Vice-Speaker*

REPORT OF THE CHAIRMAN OF THE COUNCIL

To the President and the House of Delegates:

By the time the House of Delegates meets in May 1950, the Council will have finished another year. The new members of the Council elected in 1949 have been regular in attendance and faithful in the performance of their obligations.

At each meeting of the year the Council has had a heavy schedule and I have been gratified by the earnest and conscientious manner in which the councilors have addressed themselves to their tasks.

Dr. Halverson has appeared regularly, acquainting the Council with the aims of the State Department of Public Health as well as with the viewpoint of the State Health Department. Representatives of insurance companies and representatives of many other groups met with the Council to exchange views and to adjust differences relating to the field of medicine. Substantial reports of these meetings appear in the Council minutes.

The new health commission of the California Medical Association has been formed and is expected to be of great service to C.M.A. members and to the public at large.

I would like to take this occasion to thank the members of the Council for their aid and for the effort which they have put into the work that came before the Council. I would like to thank also Dr. Murray and Mr. Hassard as well as John Hunton for their unfailing generosity and for their advice.

Respectfully submitted,
Sidney J. Shipman, *Chairman of the Council*

REPORT OF THE VICE-CHAIRMAN OF THE COUNCIL

To the President and the House of Delegates:

As Vice-Chairman of the Council I have attended all the meetings of the Council, and have aided the Chairman whenever any assistance was necessary.

Respectfully submitted,
H. Gordon MacLean,
Vice-Chairman of the Council

Report of the Council

To the President and the House of Delegates:

The Council of the Association has held five meetings since the close of the 1949 Annual Session. These were on May 11, July 9, September 24 and November 20, 1949, and January 14, 1950. Meetings have been planned approximately bimonthly as one-day sessions, with meetings of the Executive Committee intervening when indicated. Minutes of all meetings have been printed in California Medicine.

The policy of the Council is to alternate its meetings between Los Angeles and San Francisco.

As a digest of its considerations and decisions during the past year, the Council presents the following:

1. *Organization:*

Reference is made to the reports of the Secretary, the Treasurer, the Field Secretary and the Executive Secretary for details on the organizational activities of the Association. All these representatives have worked under the direction of the Council during the year and have reported regularly on their individual activities and assignments. The Council has approved all such reports, sometimes with amendments, additions and suggestions.

2. *Membership:*

At the close of 1949, the Association showed 10,003 active and associate members on its rolls, a new record high. On the basis of this membership, the Association is entitled to eleven, rather than ten, delegates to the American Medical Association for 1950, and R. Stanley Kneeshaw has been appointed the additional delegate, with Russell V. Lee as alternate, pending the election to this office at the 1950 House of Delegates meeting.

During the year the Council activated the decisions of the House of Delegates in regard to granting of Affiliate Membership and the reduction of dues in cases of protracted illness or postgraduate study. Applications for these services are routinely received under present operating methods.

A year ago the Council called attention to the fact that at the close of 1948 there were 455 members listed as delinquent in the payment of their dues. This number was pointed out as representing the accumulation of delinquencies following the waiver of dues granted to members in military service. Now that such dues waivers are no longer operating, the number of delinquent members as of December 31, 1949, was only 146. This is a normally expected number and represents, in the main, members who have moved to other locations and have not notified the Association to that effect.

3. *Industrial Medical Fees:*

The problem of industrial medical fees has been one of the gravest presented to the Council in the past year and has taken a great deal of time, thought and effort. At the present writing the question is not yet settled, although there appear to be ample signs of progress toward settlement.

Early in 1949 the Council ordered publication of a new fee schedule which had been drawn up by a special committee and presented to, and rejected by, the Industrial Accident Commission in the fall of 1948. The Council suggested that these fees be put into effect as of February 1, 1949, and that members whose statements for such fees were reduced by insurance carriers, should file claims with the Industrial Accident Commission for adjudication of the fee. This suggestion was followed by the great majority of members in the billing for services but, unfortunately, by a relatively small percentage of members in filing claims for adjudication of fees which had been reduced by the insurance carriers. At the same time, it became apparent that the great majority of the carriers were continuing to pay for compensation services on the basis of the 1946 fee schedule.

As of July 1, 1949, when the Industrial Accident Commission ruled that it no longer recognized *any* fee schedule, the Association was left in the position of having a fee schedule of its own which was not recognized by the insurance carriers; the members rendering services were left in the position of having to file and prosecute a claim for each case in which the carrier had reduced the fee claimed. While the judgments of the referees of the Commission were, in general, in favor of the claimant physician, the insurance carriers adopted a policy of disputing every such claim. In this process, the carriers contested every claim made by the physician and forced him to produce the employer and the injured workman at the hearing. This resulted in lengthy hearings and in discommoding employers and employees, particularly the latter, many of whom lost a day's wages because of the necessity of appearing to testify. Ill public relations for the medical profession followed, and many doctors concluded that their own time was worth more than the time required to press a claim, often for a small sum.

Meanwhile, a special committee appointed by the Council had been meeting with a committee of the insurance carriers and had reached a tentative agreement with the carriers on a proposed new fee schedule. This schedule was originally rejected by the Council; later, after certain modifications had been made in it, and after the Executive Committee and a subcommittee of its members had approved the proposed schedule, the Council accepted it and again presented it to the Industrial Accident Commission. At this writing the Commission has scheduled a hearing on the proposed 1950 fee schedule for February 6, 1950. It is hoped that the Commission will then approve the schedule.

In dealing with the insurance carriers, the Council and the Executive Committee were able to work out a plan whereby a committee of the Association will meet hereafter with a similar committee of the carriers to discuss (1) adjustments in the fee schedule as indicated by experience and by the requirements of the profession and (2) to discuss and adjust alleged misuse of the schedule by parties on either side. These committees would be of a continuing nature and would provide for a readjustment of the fee schedule at intervals of not more than every two years.

The Council believes that with the adoption of this joint committee procedure there will be, for the first time in 37 years, a working arrangement with the insurance interests, so that a lapse of time will not be permitted between fee schedule adjustments.

4. *Public Health:*

The Council has devoted considerable time and study to matters of public health and public agencies. It has regularly invited the State Director of Public Health, Dr. Wilton L. Halverson, to attend Council meetings, which he has done; in this way Dr. Halverson has been able to present his problems to the Council and it has been possible to accomplish advance planning on various projects.

The Council has also considered a variety of problems arising in the field of public health and allied matters, including the use of tax funds for hospital construction, the care of ambulatory veterans through private facilities, the use of federal funds for health center construction, and other matters. Subcommittees have been appointed to study each of these problems as it has arisen and these committees have served well; their reports and recommendations have been published as a part of the Council minutes from month to month.

More recently it has become apparent that problems in this field are becoming increasingly complex and more numerous. Accordingly, the Council has appointed a Committee on Public Health and Public Agencies, the function of which is to correlate the activities of the various subcommittees and to bring to the Council the recommendations to apply in treating subjects in the public health and allied fields. It is believed that the operations of this committee will be extremely helpful to the Council and to the entire Association.

The Council has adopted statements of policy relative to the use of public funds for hospital construction and to the care of indigents through private facilities. These have been published in CALIFORNIA MEDICINE.

5. *Voluntary Health Insurance:*

During the past year the Council has been approached by two different groups seeking to establish fee schedules to apply as maximum fees under commercial health insurance policies issued to policyholders who come below an established income ceiling. A special committee has met with these interests on several occasions and is continuing to meet in an effort to resolve this proposal satisfactorily.

6. *Nursing:*

A special committee has been named to meet with a similar committee of the California State Nurses' Association, in an effort to eliminate differences of policy, particularly as regards legislation. It is believed that such meetings will prevent misunderstandings and will result in the adoption of beneficial legislation for the protection of the sick.

At this writing the Council has under consideration the adoption of a statement of principles on nursing. Such statement, if adopted, will be published in CALIFORNIA MEDICINE.

7. *Public Policy and Legislation:*

The Committee on Public Policy and Legislation, Dwight H. Murray, chairman, has cooperated throughout the year with the Council. Dr. Murray and Mr. Ben H. Read, executive secretary of the Public Health League of California, regularly attend Council meetings and follow the decisions of the Council on policy matters. Much credit is due them, as well as to Mr. Howard Hassard, legal counsel, for the successful handling of the Association's legislative affairs during the last, trying session of the State Legislature.

8. *Blood Bank Commission:*

The Council has approved the program of the Blood Bank Commission and is pleased to extend its expression of appreciation to John R. Upton, chairman, and the members of the commission on their progress in establishing a statewide system of community-type blood banks. This type of blood bank has proved itself capable of maintaining solvency while serving the public, and the Council agrees that this form of blood banking should be encouraged and extended.

9. *Cancer Commission:*

Recommendations of the Cancer Commission have been approved by the Council during the year and it is gratifying to note that the program of the Cancer Commission has grown in both size and strength during the past year. In preparation at this time is a new edition of the Studies of the Cancer Commission, last publication of which was about 15 years ago. The new volume will be bound in permanent form and will constitute the latest publication on the detection and treatment of cancer in all forms and by all known means. To Lyell C. Kinney, chairman, David A. Wood, secretary, and the members of the Cancer Commission, the Council expresses its thanks for a fine work.

10. *Postgraduate Activities:*

During the past year the Council has approved the program of the Committee on Postgraduate Activities, under the direction of Carroll B. Andrews. The Committee has arranged seminars in various areas of the state and has attracted a satisfactory attendance. Dr. Andrews has now resigned, due to the pressure of other duties, and the Council has approved the appointment of Charles A. Broaddus as his successor. The Council has received an advance copy of the Committee's program for the coming year and is hopeful that it may prove valuable to a large percentage of the membership.

11. *California Physicians' Service:*

As in the past, representatives of California Physicians' Service have been invited to attend all Council meetings; also, members of the Council serve on the Board of Trustees of C.P.S. and thus maintain a liaison. The business of the C.P.S. will be before the members of the House of Delegates in their role as Administrative members of C.P.S. and the Council is confident that the delegates will understand the progress being made by C.P.S.

12. *California Medicine:*

Again the Council wishes to pay tribute to Dwight L. Wilbur and his staff on the production of an outstanding medical journal. CALIFORNIA MEDICINE is now firmly entrenched as one of the foremost state medical journals and its high quality speaks for itself. This prestige is the result of progressive publication policies under the present Editor, and the Council wishes to pay its respects and express its thanks for his valuable services. Much credit and thanks are also expressed to the members of the Committee on Advertising, who, at great personal sacrifice of time, have met at frequent intervals to screen all advertising submitted. This committee has done a yeoman service which has resulted in improved revenues for the journal and, simultaneously, a high standard of advertising. The importance of this work cannot be overestimated.

13. *Public Relations:*

As in the past few years, the Council has approved, subject to the approval of the House of Delegates, a program of public relations which is handled for the Association by the firm of Whitaker & Baxter. The present program will terminate at about the time of the Annual Session and at that time the Council, in conjunction with the Auditing Committee and the Committee on Finance of the House of Delegates, will have recommendations to make to the House of Delegates for the program for the next Association year. As a part of the long-range public relations program, the Council has delegated to the Committee on Medical Economics the task of surveying individual physician-patient relationships, a study which is now going on and on which further reports will be made by the Committee and by the Council.

14. *Legal Department:*

The Council wishes to express its appreciation of the consistently splendid services provided by Peart, Baraty & Hassard, legal counsel for the Association. Mr. Hassard and his associates have at all times been prompt in meeting all requests and in looking out for the interests of the profession. Their services are most valuable, not only to the Council but also to the entire membership, and the Council considers itself fortunate in having available such wise counsel and constant interest from its legal advisers.

15. *California Conference of Local Health Officers:*

Within the past year the Council has appointed a committee to meet with a committee of the California Conference of Local Health Officers, an official body established by the State Legislature. The meetings of these committees have resulted in a thorough understanding by both bodies of the interests and problems of each other and in a spirit of cooperation which cannot help but bring about a better working relationship between the local health officers and the local and state medical organizations. The county medical societies have been requested by the Council to give all aid and cooperation to their local health officers and the response to this request has been most gratifying.

16. *Manual on Joint Measurement:*

In May 1948, the Council was pleased to appoint Packard Thurber as its representative on a committee which proposed to produce a manual of standardized joint measurements for the determination of function in industrial accident cases. The committee completed the manual last year and arrangements have now been made to have it published in book form. It has been officially adopted by the Industrial Accident Commission and is in demand by employers, insurance carriers and others who handle such cases. Under the publishing arrangements, the Association acts as publisher and receives royalties on the sale of the manual. The Council proposes to use such royalties in meeting the costs of preparing the manual and developing the measuring instruments described in it and in doing additional development work in the furtherance of scientific measurements for these cases. The Council wishes to express its profound thanks to Dr. Thurber and his committee for the production of this valuable book.

17. *Committee on Interns and Residents:*

Following the instructions of the 1949 House of Delegates, the Council approved the appointment of a committee whose function was to develop a means of communication between the profession and the senior medical students, interns and residents, with a view toward preparing the young doctors for their entrance into private practice. This committee has proposed the publication of a news bulletin at bimonthly intervals, in which the hospital staff members and students may participate and in which pertinent information may be published. The initial issue of this bulletin is now in work and the Council is hopeful that through this method a more concrete appreciation of medical practice may be gained by the graduating classes. To J. Lafe Ludwig and his committee, the Council expresses its appreciation.

18. *Conclusion:*

In conclusion, the Council wishes to express its appreciation to all the members who have served on standing or special committees during the past year and who have been willing to sacrifice their own interests in favor of those of the Association. Likewise, to those members who have assisted and cooperated with the Council, the officers and the Association, many thanks are due and are gladly given.

To the officers who have given freely of their time and talents, the Association owes a deep debt of gratitude. Particularly is this true of the Secretary-Treasurer, who is completing his third year of service without compensation and who is always alert to the problems facing the Association and more than willing and able to devote all his powers to their solution.

Respectfully submitted,
SIDNEY J. SHIPMAN, *Chairman*

REPORT OF THE PRESIDENT OF THE TRUSTEES OF THE C.M.A.

To the President and the House of Delegates:

The Trustees of the California Medical Association is a corporation, the sole function of which is to hold assets accumulated by the Association. The members of the Trustees are the members of the Council at all times. The Trustees have met during 1949 in accordance with the requirements of the Constitution and By-Laws, and the financial reports of the corporation are printed under the report of the Treasurer.

Respectfully submitted,
R. STANLEY KNEESHAW, *President*

REPORT OF THE SECRETARY

To the President and the House of Delegates:

Your Secretary has attended the meetings of the Council and the Executive Committee during the past year. He has also attended meetings of the Committee on Scientific Work, most meetings of the Committee on Postgraduate Activities, and meetings of several other committees appointed by the House and the Council. His main function, as in previous years, has been in connection with the Committee on Scientific Work, the report of which is found elsewhere in this issue.

The minutes of the Council meetings prepared by the Executive Secretary and edited by the Secretary, the Chairman of the Council, and Legal Counsel, should be read in detail by all members.

The Secretary respectfully suggests that the duties connected with the office are sufficient to warrant the appointment of a half-time or even full-time physician. It has been his great privilege to serve at the request of the Council as Acting Secretary in an honorary capacity and without stipend. A regular half-time or full-time basis of appointment would probably be in the better interests of the Association.

Sincere thanks are due the officers of the Association and the staff of the Association's office for their cooperation and assistance during the year, notably to Mr. Hunton, Mr. Wheeler and Mrs. Rooney.

Your Secretary would also express his gratitude to Legal Counsel for the Association; the vast amount of work performed each year by Mr. Howard Hassard on behalf of the medical profession of California cannot be easily recorded or ever repaid.

Respectfully submitted,

L. Henry Garland, *Secretary*

REPORT OF LEGAL DEPARTMENT

To the President and the House of Delegates:

The Legal Department submits the following summary covering the nature of its activities during the year 1949, and up to the time of preparation of this report, February 1950:

During the past year we have attended all meetings of the Council and Executive Committee, as well as various meetings of standing committees and other agencies of the Association. We have also prepared and submitted opinions on a number of subjects, as requested by the Association or its officers or component societies. These have covered a wide range, including disciplinary procedural questions, questions of interpretation of the principles of medical ethics, the relationship of hospitals to the practice of medicine, the lack of right of public agencies to inspect physician-patient records wherever located, the legal status of local hospital districts, anti-rebating legislation, hypnotic drug legislation, the application of anti-trust laws to various phases of medical practice and the organization of medical care, and problems related to malpractice and malpractice insurance.

In addition to our ordinary and advisory services, we have also undertaken, at the instruction of the Council, the following:

1. *Malpractice cases:*

As amici curiae, we have appeared in two extremely important malpractice cases before the California Supreme Court. In each case we prepared and filed briefs on behalf of the defendant physicians.

In the first case, *Sinz v. Owens*, the Supreme Court ultimately held that the test for determining the competency of a physician as an expert witness is familiarity of the physician with the degree of skill, knowledge and care ordinarily possessed and exercised by members of his profession *under similar circumstances.* This is in effect a modification of the old rule that to qualify as an expert a physician must be familiar with the degree of skill, knowledge and care ordinarily possessed and exercised by members of his profession *in the same locality or vicinity.* In the same case, the Supreme Court also held that a general practitioner is not to be held to the degree of skill and care of a specialist, unless "under the circumstances a reasonably careful skillful general practitioner would have suggested the calling into consultation of a specialist" and the general practitioner failed to do so.

In the second case, *Moore v. Belt,* the Supreme Court held that the so-called doctrine of "common knowledge" which eliminates the necessity of expert testimony, does not apply to the mere circumstance that chills and fever followed within a day or two after a cystoscopic examination by a physician specializing in urology. The court also held that the trial judge properly excluded expert testimony by an autopsy surgeon who was not particularly familiar with the practice of urology. This decision is the first illustration of the meaning of the term "under similar circumstances" announced as the test of competency of an expert witness in the earlier case of *Sinz v. Owens.* The court in effect held, where the defendant was a specialist in urology, that similar circumstances required that a physician undertaking to be an expert witness be familiar with common practices in that specialty. This does not necessarily mean that only a specialist in the same specialty as the defendant may be a witness; it does mean, however, that in order to qualify as an expert witness one must be reasonably familiar with the ordinary skill and knowledge and the common practices of the particular phase of medicine involved.

2. *Legislation:*

We have assisted the Committee on Public Policy and Legislation both with respect to a great number of bills that were before the 1949 California Legislature, and with a great mass of bills that are now pending before the United States Congress. In this connection, it is to be noted that Congress has broken out with a rash of health insurance bills of all types and classifications. In addition, during the past two years there have been a number of less spectacular but equally important bills proposed in Congress affecting the medical profession and medical care. These include subsidization of medical schools, subsidization of medical education, extension of social security into the field of disability insurance, increasing federal grants for hospital construction and so-called health centers, proposals for federal subsidization of local health departments, chronic diseases, and many other particular segments of medical care. The trend for the past 20 years toward increasing proposals for governmental action within the field of medical care continues unabated and shows no sign of termination or modification.

3. *Industrial Fee Schedule:*

We have assisted the Committee on Industrial Practice, the Executive Committee and the Executive Secretary, in connection with the industrial fee schedule. This has involved numerous meetings and several appearances before the Industrial Accident Commission. The details of this subject will be reported by the committee and the Council.

There have been other services performed by the Legal Department, which will be reported orally to the House of Delegates.

We wish to reiterate our constant desire to serve the medical profession to the best of our ability.

Respectfully submitted,

Peart, Baraty & Hassard,
General Counsel

REPORT OF THE EXECUTIVE SECRETARY

To the President and the House of Delegates:

Your Executive Secretary presents his report in sections, as in past years, for purposes of clarity.

1. *General:* The Association office occupies the same space as a year ago and office personnel remains at the same level, namely, three men and five women employees. In addition, space is made available for committee chairmen or directors, as needed. The Southern California office, located in the Subway Terminal Building, Los Angeles, continues to serve as the headquarters for the Field Secretary.

Office equipment has been maintained in good condition and new items have been purchased as needed. Within the past year an electric typewriter and a graphotype, for making address plates, have been added to the major equipment. The electric typewriter has made possible an improvement in the quality of mimeograph work as well as general typing, and the graphotype has not only reduced the expense of making address plates but has made it possible to keep the membership mailing list strictly up to date, without the time lag required when this work was done by commercial concerns.

As the Association grows in size, it also grows in its activities and within the next year it is quite likely that additional office facilities will be required. Space adjoining the present office may soon become available and plans are already under consideration for adding such space to the office as a means of gaining greater efficiency in operations.

2. *Meetings:* The Executive Secretary has attended all meetings of the House of Delegates, the Council and the Executive Committee. He has also attended meetings of various committees of the Association, including the Committee on Industrial Practice, Committee on Advertising, Committee on Public Policy and Legislation, and others. He has cooperated with other committees and commissions, including the Cancer Commission and the Blood Bank Commission. He has served as an aide to the Association's delegation to the A.M.A. at the semi-annual meetings and has participated in various national organization meetings, including the Conference of Presidents, Conference of Secretaries and Editors of State Medical Associations, Medical Society Executives Conference, etc.

The Executive Secretary has been pleased to answer requests for his appearance at county medical society meetings, before service clubs and other groups seeking a speaker, and before committees of the Legislature and other governmental bodies. He has appeared in both private and public meetings with the Industrial Accident Commission in regard to medical and surgical fees for industrial accident cases.

3. *Financial:* Probably the greatest single responsibility placed on the Executive Secretary is the management of the Association's finances. Each year the House of Delegates adopts a budget, which provides for the collection of dues from the members and outlines the manner in which such collections are to be expended. Under the report of the Treasurer will be found a complete accounting of the funds collected and expended in the fiscal year ended June 30, 1949. This shows that the budgeted income from dues and general sources for the fiscal year, $422,500, was more than met in collections of $479,600. Administrative expenses, budgeted at $136,500, actually were $112,878, considerably below the budget and $8,701 less than in the previous fiscal year. Expenditures for scientific, educational and public relations activities, budgeted at $294,000, actually were $246,249.

California Medicine, the official journal, was budgeted at an income of $104,100 and expenses of $107,500. The experience of the fiscal year was an income of $108,157 and expenses of $95,114, resulting in a profit of $13,043 rather than the budgeted loss of $3,400. The journal is operated on a cost-accounting basis, with rent, salaries and other expenses charged directly against it and with $3 per active member credited to it from members' dues. This credit is in accordance with postal regulations requiring at least 50 per cent of the published subscription rate to be so credited.

The net result of general and journal revenues is in excess of anticipated budget figures, and expenses of both below the budget, was a net gain in surplus for the fiscal year of $113,518, the bulk of which was transferred to the Trustees of the California Medical Association, a holding company, for investment in U. S. Treasury bonds. The balance sheet and operating statement of the Trustees are printed under the report of the Treasurer.

4. *California Medicine:* The financial results of the official journal have been commented on in preceding paragraphs. On the operational side, the journal has continued along the lines of policies adopted by the Editorial Board and the Editor and has continued to strengthen itself both locally and nationally. It is gratifying to receive an increasing number of complimentary remarks about the journal, to see it quoted widely in national publications and to witness the emulation of some of its methods of presentation and format by other publishers. It is safe to say that the journal has reached a place high on the list of the state medical journals, which is a tribute to the Editor and his staff.

Advertising in the journal continues to gain in volume and income. The Committee on Advertising meets regularly, sometimes as frequently as three times monthly, to screen the advertising offered, to consider the acceptability of new products and to review and pass upon new copy for accepted products. While this fine screening results in the rejection of a considerable volume of advertising, and while it has caused some friction between the business side of the journal and the representatives of advertisers, it must be concluded that the quality of advertising in the journal has maintained a consistently high level and that the publication has gained immeasurably in stature among the producers who place the bulk of the advertising. The policies of the Committee on Advertising have been well established among the producers and their agencies and are adhered to in fine fashion.

The Executive Secretary gladly gives all credit for these accomplishments to the Editor and his assistant, the advertising manager and the Committee on Advertising, all of whom have been extremely diligent in carrying out their assignments and in creating a journal of such stature. The Executive Secretary confers with these members and employees, sits with the committee and consults with all on particular problems; otherwise, his direct duties with the journal are left in the hands of the above.

5. *Committee on Industrial Practice:* The Executive Secretary has worked during the year with the Committee on Industrial Practice and with the Council, the Executive Committee and two special committees in the preparation and presentation to the Industrial Accident Commission of a revised schedule of fees for medical and surgical services rendered to injured workmen under the compensation laws. This has involved numerous meetings with committees, with representatives of the insurance carriers and with members of the State Industrial Accident Commission. It has also meant a considerable volume of mimeographing and printing of proposed schedules, mailing of letters to members, execution of policies adopted by the Council and other responsible bodies of the Association, and numerous other details. The subject of compensation fees is extremely complex and encompasses so many factors that a continuing association with all angles is essential to a thorough understanding of

the problem. The fee schedules now under consideration are recognized as not perfect but are believed to be a definite improvement over former fee schedules; at the same time, the establishment, for the first time in 37 years, of a working arrangement with the insurance carriers, to provide a continuing review of the fee schedule and of all related matters, is considered a great advance over the position previously occupied by the Association.

6. *Public Policy and Legislation:* The Executive Secretary has continued to cooperate with this important activity and has followed the instructions of the committee and its chairman.

7. *Annual Session:* At this writing, plans are going ahead for the 1950 Annual Session to be held in San Diego. Inasmuch as the Association has not met in San Diego since 1940, when the size and activities of the organization were considerably less than now, various difficulties have been encountered in planning for a smoothly-operating program. However, it is hoped to eliminate all difficulties prior to the time of the meeting and to produce a session satisfactory to those participating and attending. The scientific exhibit will be larger than at any time in the past, as will the technical exhibit. A program of medical motion pictures will also be presented and the number of scientific meetings will be greater than usual.

8. *Conclusion:* The Executive Secretary wishes to acknowledge, with deep gratitude, the aid and cooperation given him at all times during the past year. The Chairman of the Council and the Secretary have at all times given sound and ready counsel. The Editor has been most cooperative and the officers and Councilors have consistently given every aid in the management of the Association's affairs. Among the lay personnel the Legal Counsel, the Field Secretary and the executive secretary of the Public Health League of California have consistently aided and cooperated to the utmost. The office staff has been on the job and ready to meet any challenge, and the loyalty, efficiency and attitude of these men and women are gratefully acknowledged.

Respectfully submitted,

JOHN HUNTON, *Executive Secretary*

REPORT OF THE EDITOR

To the President and the House of Delegates:

Probably the most noteworthy development with regard to CALIFORNIA MEDICINE in the past year was an improvement in the quality of manuscripts submitted for consideration by the Editorial Board. Although the average level of quality is of course not subject to precise measurement, indeed may be gauged only as impression, in general it can be said that the manuscripts received were better prepared, as judged by both scientific and literary standards, than those submitted in previous years.

While this is a wholly desirable condition, it poses for the members of the Editorial Board a greater problem in selection of papers for publication—a problem made the more acute by the fact that the number of manuscripts offered last year was greater than before: In 1949, 307 papers were submitted and only 160 were accepted. The following tabulation shows the number of manuscripts received from the Annual Session and of those submitted directly to CALIFORNIA MEDICINE in the last three years, together with the number accepted in each category:

	Annual Session		Other		Totals	
	Rec'd	Accepted	Rec'd	Accepted	Rec'd	Accepted
1947......	161	88	114	52	275	140
1948......	155	138	117	88	272	226
1949......	176	87	131	73	307	160

Not only for the considerable task of reviewing more and more material, but for the exercise of discriminating judgment in selection, the members of the Editorial Board have the editor's earnest thanks. The work of others who have contributed to CALIFORNIA MEDICINE—those who have prepared special material on assignment and those who have reviewed books—is acknowledged with gratitude. The assistant to the editor, Robert F. Edwards, has again done an outstanding job aiding in the preparation of manuscripts and in supervising the excellent set-up of the Journal.

A suggestion made often and by many is that short items of casual interest be published in the space now left blank at the end of articles. Material suitable for the purpose is not easily come by, but attempt will be made to get it. Two such items have been published recently, one on page 33 of the January 1950 issue and the other in February, page 84. They may be considered as examples. Readers who have talent for short, light essay or report on subjects of incidental interest to physicians are hereby asked to exercise it. White space beckons.

Respectfully submitted,

DWIGHT L. WILBUR,
Editor, CALIFORNIA MEDICINE

REPORT OF THE TREASURER

To the President and the House of Delegates:

The duties of the Treasurer of the Association are nominal only, the actual duties of the office being performed by the office staff and the audit of accounts by an independent certified public accountant. In his annual audit, the independent accountant checks the receipt and expenditure of all funds, verifies the appropriations for specific purposes of reference to the budget adopted by the House of Delegates and resolutions adopted by the Council, and certifies the presence of cash, securities and other assets shown in the final report.

Submitted herewith is a series of accounts prepared by Hood and Strong, certified public accountants, covering the receipts and disbursements of funds for the fiscal year July 1, 1948, to June 30, 1949. These accounts reflect the transactions of the California Medical Association and the Trustees of the California Medical Association, the corporate holding company established by the Association some years ago to hold reserves accumulated by the Association. The tables show income and expense accounts of both organizations, balance sheets of both as of June 30, 1949, and a combined balance sheet of both as of the close of the fiscal year. Members are urged to study both sets of accounts for a true picture of the Association's financial position. The corporation is wholly owned by the Association.

The Association is now a large organization, dispensing large sums of money each year. The office staff attempts to keep precise records of all expenditures and to account for same fully to the Auditing Committee. As a periodic additional check on the efficiency of our audit, it is recommended that consideration be given to rotating the auditors of the Association's books every five or ten years, the new auditor to be chosen by the Executive Committee of the Association, acting upon its own information, and independently of the Treasurer or office staff. A periodic reappraisal by independent eyes is healthy for every organization.

Respectfully submitted,

L. HENRY GARLAND, *Treasurer*

(Balance sheets and statements of income and expenditure appear on following pages.)

CALIFORNIA MEDICAL ASSOCIATION

San Francisco, California

STATEMENT OF INCOME AND EXPENDITURE

Comparative for Years Ended June 30, 1949 and June 30, 1948

INCOME	Year Ended		Increase (Decrease)
	June 30, 1949	June 30, 1948	
DUES AND GENERAL:			
Membership Dues, less portion allocated to Journal Subscriptions	$462,569.75	$531,607.00	($69,037.25)
Exhibitors at Annual Meeting	15,880.00	12,010.00	3,870.00
Interest Earned	1,151.06	7.53	1,143.53
Miscellaneous	....	56.72	(56.72)
	$479,600.81	$543,681.25	($64,080.44)
OFFICIAL JOURNAL—*“California Medicine”*:			
Advertising	$ 75,435.98	$ 67,502.76	$ 7,933.22
Members' Subscriptions—Allocated from Dues	29,893.50	27,978.00	1,915.50
Cash Subscriptions	2,279.46	1,759.70	519.76
Reprints	548.16	367.64	180.52
	$108,157.10	$ 97,608.10	$10,549.00
TOTAL INCOME	$587,757.91	$641,289.35	($53,531.44)
EXPENDITURE			
Administration	$112,877.89	$121,578.66	($ 8,700.77)
Scientific, Educational and Public Relations	246,248.72	232,229.05	14,019.67
Official Journal—*“California Medicine”*	95,113.63	88,551.52	6,562.11
TOTAL EXPENDITURE	$454,240.24	$442,359.23	$11,881.01
EXCESS OF INCOME OVER EXPENDITURE	$133,517.67	$198,930.12	($65,412.45)

CALIFORNIA MEDICAL ASSOCIATION

San Francisco, California

STATEMENT OF EXPENDITURE

Comparative for Years Ended June 30, 1949 and June 30, 1948

	Year Ended		Increase (Decrease)
	June 30, 1949	June 30, 1948	
ADMINISTRATION:			
Salary—Executive Secretary	$ 16,333.30	$ 14,333.26	$ 2,000.04
Salaries—Administrative	10,462.50	4,925.00	5,537.50
Salaries—Clerical	8,229.17	12,464.37	(4,235.20)
Traveling:			
Executive Secretary—Secretary	1,113.71	1,329.80	(216.09)
Officers	148.00	579.43	(431.43)
Council and Executive Committee	4,086.54	4,871.37	(784.83)
Delegates to A.M.A. Convention	13,513.67	10,300.85	3,212.82
Office Equipment purchased	2,295.04	2,102.47	192.57
Taxes—Social Security	400.06	465.45	(65.39)
Annual Meeting Expense	21,967.94	19,946.12	2,021.82
Legal Expense:			
Retainer Fee	6,000.00	6,000.00	....
Other Legal Expense	2,567.89	3,631.87	(1,063.98)
Pensions	4,740.00	4,740.00	....
Los Angeles Office Expense	2,768.22	341.04	2,427.18
Rent	5,482.64	6,771.11	(1,288.47)
Office Supplies and Expense	4,010.97	2,887.17	1,123.80
Postage	746.90	484.48	262.42
Telephone and Telegraph	2,277.25	2,207.04	70.21
Council and Executive Committee Expense	2,253.90	2,208.64	45.26
Contributions to United Public Health League	43.89	20,119.56	(20,075.67)
Woman's Auxiliary	750.00	750.00	....
Annuities	1,679.92	54.12	1,625.80
Miscellaneous	1,006.38	65.51	940.87
	$112,877.89	$121,578.66	($ 8,700.77)
SCIENTIFIC, EDUCATIONAL AND PUBLIC RELATIONS:			
Department of Public Relations	$134,430.55	$160,636.63	($26,206.08)
Public Policy and Legislation	68,070.72	39,625.97	28,444.75
Physicians Benevolence	9,730.50	9,512.00	218.50
Postgraduate Activities	10,208.24	4,956.46	5,251.78
Cancer Commission	6,718.18	5,721.95	996.23
Other Committee Activities	12,225.29	4,693.08	7,532.21
Medical Economics	....	2,326.96	(2,326.96)
Subscriptions to Libraries	4,865.24	4,756.00	109.24
	$246,248.72	$232,229.05	$14,019.67
OFFICIAL JOURNAL—*“California Medicine”*:			
Printing	$ 62,393.89	$ 65,757.03	($ 3,363.14)
Advertising Sales Expense	7,858.72	6,360.93	1,497.79
Salaries	13,941.13	8,675.00	5,266.13
Telephone and Telegraph	605.74	....	605.74
Office Supplies and Expense	749.40	1,293.94	(544.54)
Illustrations	1,447.13	1,218.85	228.28
Addressograph	1,461.25	1,107.19	354.06
Postage and Mailing	3,504.61	3,270.15	234.46
Rent	1,904.00	....	1,904.00
Editorial Board Travel	....	49.04	(49.04)
Advertising Discounts	1,247.76	819.39	428.37
	$ 95,113.63	$ 88,551.52	$ 6.562.11
TOTAL EXPENDITURE	$454,240.24	$442,359.23	$11,881.01

CALIFORNIA MEDICAL ASSOCIATION

San Francisco, California

Balance Sheet—June 30, 1949

ASSETS				
Cash			$115,518.01	
In Banks		$115,495.70		
Commercial Accounts	$114,866.66			
Savings Accounts	629.04			
Petty Cash		22.31		
Accounts Receivable			2,092.77	
Journal Advertisers		977.10		
Total	$ 1,477.10			
Less Reserve for Doubtful Accounts	500.00			
Miscellaneous		1,115.67		
Loan Receivable—New Mexico Physicians Service			0.00	
Total		17,500.00		
Less Reserve		17,500.00		
Investments—U. S. Treasury Bills			299,564.43	
Trust Funds			14,874.55	
Morris Herzstein Bequest		4,487.21		
Benevolence Fund		10,387.34		
Furniture and Fixtures—Nominal Value			1.00	
Deferred Charges			781.10	
Prepaid Rent		539.03		
Other Prepaid Expense		242.07		
Deposits			700.88	
United Air Lines		425.00		
U. S. Post Office		275.88		$433,532.74

LIABILITIES			
Accounts Payable		$ 9,746.12	
Journal Production	$ 356.78		
Other Accrued Expenses	6,235.20		
Withholding Tax	793.10		
Social Security Taxes	327.54		
County Societies	438.50		
American Medical Association	1,375.00		
Miscellaneous	220.00		
Trust Accounts		14,874.55	
Unexpended balance of Income Received under Morris Herzstein Bequest	4,487.21		
Benevolence Fund	10,387.34		
Surplus		408,912.07	$433,532.74

TRUSTEES OF CALIFORNIA MEDICAL ASSOCIATION (A CORPORATION)

San Francisco, California

STATEMENT OF INCOME AND EXPENDITURE

Comparative for the Years Ended June 30, 1949 and June 30, 1948

	Year Ended		
INCOME	June 30 1949	June 30, 1948	Increase (Decrease)
Interest on Bonds	$ 22,183.55	$ 18,773.80	$3,409.75
Interest on Savings Accounts	13.58	100.60	(87.02)
Miscellaneous	....	40.00	(40.00)
Total Income	$ 22,197.13	$ 18,914.40	$3,282.73
EXPENDITURE			
Premium on Bonds purchased	$ 207.21	$ 93.75	$ 113.46
Audit Fee	170.00	130.00	40.00
Miscellaneous	31.00	31.00	....
Total Expenditure	$ 408.21	$ 254.75	$ 153.46
Excess of Income Over Expenditure	$ 21,788.92	$ 18,659.65	$3,129.27

CALIFORNIA MEDICAL ASSOCIATION

AND

TRUSTEES OF CALIFORNIA MEDICAL ASSOCIATION (A CORPORATION)

San Francisco, California

COMBINED COMPARATIVE BALANCE SHEET

ASSETS	California Medical Association	Trustees of California Medical Association	Combined June 30, 1949	Combined June 30, 1948	Increase (Decrease)
Cash	$115,518.01	$ 3,626.17	$ 119,144.18	$ 287,676.88	($168,532.70)
Marketable Securities	299,564.43	898,000.00	1,197,564.43	865,000.00	332,564.43
Accounts Receivable	2,092.77	....	2,092.77	17,561.16	(15,468.39)
Loan Receivable	17,500.00	....	17,500.00	17,500.00	....
Endowment Fund	....	272.65	272.65	268.62	4.03
Benevolence Fund	10,387.34	22,793.93	33,181.27	30,412.09	2,769.18
Trust Fund	4,487.21	....	4,487.21	4,033.32	453.89
Furniture, Equipment, Etc	1.00	....	1.00	1.00	....
Deferred Charges	781.10	....	781.10	761.05	20.05
Deposits	700.88	....	700.88	625.00	75.88
	$451,032.74	$924,692.75	$ 1,375,725.49	$ 1,223,839.12	$151,886.37
LIABILITIES—RESERVES AND SURPLUS					
Accounts Payable	$ 9,746.12	$	$ 9,746.12	$ 16,393.44	($ 6,647.32)
Members' Contribution to Endowment Fund	....	272.65	272.65	268.62	4.03
Benevolence Fund	10,387.34	22,793.93	33,181.27	30,412.09	2,769.18
Trust Account	4,487.21	....	4,487.21	4,033.32	453.89
Reserve for Loan Receivable	17,500.00	....	17,500.00	17,500.00	....
Surplus	408,912.07	901,626.17	1,310,538.24	1,155,231.65	155,306.59
	$451,032.74	$924,692.75	$ 1,375,725.49	$ 1,223,839.12	$151,886.37

TRUSTEES OF CALIFORNIA MEDICAL ASSOCIATION (A CORPORATION)

San Francisco, California

BALANCE SHEET—JUNE 30, 1949

ASSETS

CASH			$ 3,626.17	
Commercial Account		$ 3,397.84		
Bank of America, N. T. & S. A.	$3,397.84			
Savings Account		228.33		
Bank of America, N. T. & S. A.	80.01			
American Trust Company	96.81			
Wells Fargo Bank & Union Trust Co.	51.51			
INVESTMENTS—U. S. Government Bonds			$98,000.00	
BENEVOLENCE FUND			22,793.93	
Crocker First National Bank		793.93		
U. S. Government Bonds—Maturity Value		22,000.00		
ENDOWMENT FUND			272.65	
Bank of America, N. T. & S. A.—Savings Account		272.65		$924,692.75

LIABILITIES AND SURPLUS

MEMBERS' CONTRIBUTION TO ENDOWMENT FUND		$ 272.65	
BENEVOLENCE FUND		22,793.93	$ 23,066.58
SURPLUS			$901,626.17
Representing the amount by which the total Assets exceed the Liabilities as of June 30, 1949:			
Contributed Surplus		781,775.28	
California Medical Association	$781,775.28		
Earned Surplus		119,850.89	
Balance, July 1, 1948	98,061.97		
Add, Net Income for fiscal year ended June 30, 1949	21,788.92		

REPORTS OF DISTRICT COUNCILORS

FIRST COUNCILOR DISTRICT

Imperial, Orange, Riverside, San Bernardino and San Diego Counties

To the President and the House of Delegates:

As has been true each year since the close of the war, the First Councilor District has continued to gain in membership. San Bernardino, Riverside, Orange and San Diego county societies all have additional members in the House of Delegates.

It is apparent that each society in the district is fully aware of the progress we are making in combating compulsory health insurance and that the public relations program in each is keeping abreast of our rapidly changing times.

In addition to attending all of the Council meetings this past year and endeavoring to carry out the instructions of the House of Delegates, I have gone to Sacramento when called to assist in combating bills detrimental to the profession and to the hospital associations, and have made it a policy to improve my acquaintance and friendship with our legislators both in Sacramento and in Washington. It is my earnest hope that all doctors foster the same relationship with our legislators.

It is strongly urged that all members attend the annual meeting of the California Medical Association in San Diego and that each member attend the meetings of the House of Delegates. It is through the action of the House of Delegates that the Council is directed. It is to our mutual advantage that the members of the California Medical Association as well as the delegates attend these meetings.

Respectfully submitted,

JOHN D. BALL, *Councilor,*
First District

SECOND COUNCILOR DISTRICT

Los Angeles County

To the President and the House of Delegates:

Again I urge all members of the California Medical Association attending the annual meeting to be present at all of the deliberations of the House of Delegates. Only by so doing can the members throughout the state understand and appreciate the enormous amount of work confronting our Association in 1950. It is as important for the members to attend the House of Delegates and hear their deliberations as it is for them to read the news letters, journals, and all communications and reports sent to them from time to time by the Association.

I wish also to remind the members that the House of Delegates will discuss all phases of our California Physicians' Service. Much information and understanding can be had by hearing first-hand all of the committees' reports, as well as the financial standing and the policy of the California Physicians' Service for the future.

The minutes of each of the meetings of the Council have appeared in our California Medical Association journal and I hope all members have read them thoroughly.

While the House of Delegates is in session is the time for all members wishing to present resolutions to contact their delegates. Also, while the various committees are in session, members at large are invited to appear and discuss resolutions. More members taking an active part in our Association's business, especially at the time of the annual meetings, is very desirable. It is also hoped that all county branch and hospital officers will attend these meetings.

Respectfully submitted,

JAY J. CRANE, *Councilor,*
Second District

THIRD COUNCILOR DISTRICT

Kern, San Luis Obispo, Santa Barbara, Ventura and Inyo-Mono Counties

To the President and the House of Delegates:

The five societies comprising the Third Councilor District are all very active and thoroughly conversant with the existing medical problems. They are working harmoniously, both individually and collectively, for the betterment of the practice of medicine.

Three of the counties are now working together in the establishment of a tri-county blood bank which should be functioning before the expiration of 1950. This will fill a long-felt need in the area which has heretofore had no blood bank facilities.

Respectfully submitted,

H. E. HENDERSON, *Councilor,*
Third District

FOURTH COUNCILOR DISTRICT

Fresno, Madera, Kings, Tulare, Merced, Mariposa, Calaveras, San Joaquin, Tuolumne, and Stanislaus Counties

To the President and the House of Delegates:

During fifteen years of continuous service as a member of the Council of the C.M.A. there has been a struggle for the right to practice medicine in the American way. The chief policy of the C.M.A. has been to defeat governmental encroachment on and control of medical services.

Our success in defeating proposed legislation for state medicine during this long period has, I'm afraid, produced a feeling of security and complacency on the part of many members of the C.M.A., and the long continued warnings against this persistent danger are ignored by many and not sufficiently understood by many younger members of the profession.

It is now apparent that the labor-dominated government at Washington is determined to force upon the American people not only a system of government medical care but is also planning to follow the lead of Great Britain to socialize other services and industries. Since history does not provide an example of a socialist state enduring for any prolonged period but must shortly become a dictatorship of the communistic type, the personal liberties and rights under our constitution are seriously threatened. As state control of medical service has been one of the first objectives of the socialist reformers in other countries, the medical profession has been called upon to carry the ball for the opposition in this national football game to change over our American system of government.

A very fine start has been made by the A.M.A. in its national effort of educational propaganda. The vast business interests and industries of this country apparently do not realize what they have at stake in this battle. If our efforts were properly supplemented by similar national propaganda by these interests, it seems probable that the trend toward socialism could be reversed. The medical profession as a whole needs further pep talks and aggressive teamwork and be made to realize that this fight may continue for a long time. Attempts will be made, undoubtedly, to get legislation which will take over medical practice by degrees if the effort to get complete compulsory health insurance by the federal government fails. Every bill introduced into the legislature of the states and in Congress that affects medical practice should be closely scrutinized and opposed when harmful. I still hope and believe that with teamwork and loyalty to our organizations we can ward off the threat of socialized medicine and do the greatest possible service to our country in helping to ward off a socialistic and communistic form of government.

The membership of the C.M.A. of this district have been greatly augmented during the past year and are working quite harmoniously not only in the care of their patients, but are giving time and thought to our mutual problems. In Fresno County, the executive secretary of the Fresno County Medical Society, Mr. Glenn Gillette, has done an outstanding job in directing the activities of committees and in the publication of a very excellent bulletin and also in improving the public relations of the profession. Usual visits by the Councilor and attention to his duties will be carried out until a successor is elected.

Respectfully submitted,

A. E. ANDERSON, *Councilor,*
Fourth District

FIFTH COUNCILOR DISTRICT

Monterey, San Benito, San Mateo, Santa Clara and Santa Cruz Counties

To the President and the House of Delegates:

The Fifth Councilor District has again shown an increase in medical personnel this year. The various societies have all held regular meetings with very good attendance. Santa Cruz County now has a membership of 70 to take care of a goodly increase in population, Monterey County has likewise increased its membership. Santa Clara County this year has reorganized and has rewritten its medical society constitution and streamlined its work into new committees. It has also worked out an excellent plan to staff its new emergency hospital in San Jose. The society has this year made a very excellent contribution to the advancement of voluntary health insurance through local newspapers and its efforts to assure every indigent patient in the county of free medical service if he will will apply for it. It expects to further a very practical public relations program this coming year. San Mateo County is completing the new Sequoia District Hospital in Redwood City and the preliminary drawings are ready for building a new district hospital in Burlingame.

San Mateo County has employed a full-time executive secretary and is expecting to go ahead now with a more progressive public relations program than it had formerly. The Fifth District has enjoyed a year of few difficulties, an increase in medical population and a large increase in the population as a whole. The membership of this district seem well aware of the problems medicine faces in the political field and are active in the solution of such problems.

HARTZELL H. RAY, *Councilor,*
Fifth District

SIXTH COUNCILOR DISTRICT

San Francisco County

To the President and the House of Delegates:

Your councilor from the Sixth District assumed his office on May 11, 1949, after our San Francisco County Medical Society delegation failed to persuade Edwin L. Bruck to continue in the office he had held with outstanding distinction. In the eight months of his term your councilor was absent from one meeting (July 9) due to a conflict which predated his election to office.

During the year 1949 the San Francisco County Medical Society has continued to improve its relations with the public and to increase its service to the membership. The society has established an emergency service whereby the patient is put in direct contact with a member who agrees to assume immediate responsibility for the required medical care. The three-name referral for non-emergency problems has been expanded and continued on a 24-hourly basis.

The bureau of medical economics and the professional conduct committee have continued to be important means for reducing friction that sometimes occurs between patients and physicians. Recently measures have been taken to better acquaint segments of organized labor with the value these services could have for their membership.

The sickness insurance program set up in 1948 has developed into a real boon to a number of our members.

The society's speakers' bureau was very active in the National Education Campaign for the American Medical Association covering the field of health insurance. Many speaking and numerous debating engagements were met. In this connection our city was host on April 29 to 650 physicians and lay friends, several representing other western state medical associations, when Senators Allen J. Ellender and Harry P. Cain, of Louisiana and Washington respectively, and Mr. Robert R. Gros, of the public relations department of the Pacific Gas and Electric Company, and President E. Vincent Askey, California Medical Association, gave a rousing program which contributed enormously to a fuller understanding of the significance of the threat of governmental control of the practice of medicine.

The year 1949 ended with a membership in the society of 1,519 physicians.

The year 1950 promises to be one of further growth in membership and service on the part of the San Francisco County Medical Society.

Respectfully submitted,

M. LAURENCE MONTGOMERY, *Councilor,*
Sixth District

SEVENTH COUNCILOR DISTRICT

Alameda and Contra Costa Counties

To the President and the House of Delegates:

The soundness of the Alameda County Medical Association's program has attracted national interest in the past year. Articles in the *Woman's Home Companion, Nation's Business* and *Medical Economics* have excited both lay and professional inquiry in a plan of the medical profession to meet its full public responsibility. A study by the American Medical Association and state societies portends a further spread of the Alameda County Medical Association's philosophy of the guarantee of a high quality of medical care to everyone. This widespread interest and publicity is tangible proof of the Alameda County Medical Association's premise that the best way to get favorable commendation is to do a good job.

The benefits of this program are shared by the members of the Contra Costa Medical Society.

Respectfully submitted,

DONALD D. LUM, *Councilor,*
Seventh District

EIGHTH COUNCILOR DISTRICT

Alpine, Amador, Butte, Colusa, Eldorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Sutter, Tehama, Yolo and Yuba Counties

To the President and the House of Delegates:

During the past year an attempt has been made to keep the county societies comprising this Councilor District informed regarding the policies and problems of the C.M.A. which affect county societies, and to assist these societies in utilizing the facilities of the C.M.A. when possible. Many sections of this portion of the state are in need of additional private hospital facilities. In Colusa County the lack of adequate standards of medical and hospital care in the Colusa Memorial Hospital is a matter of serious concern to the Sutter-Yuba-Colusa Society and to responsible citizens of that community.

During the past year the attempt to secure an adequate Industrial Fee Schedule has been of general interest, since the majority of doctors in this area have a direct interest at stake.

Although this district embraces some of the most sparsely settled areas of the state, adequate numbers of doctors appear to be available throughout with the usual oversupply in the larger centers where many new men tend to locate.

Blood-banking facilities under medical direction are gradually being extended, although the distances from the northern portion of the state to the larger communities involve certain difficulties which have not yet been entirely overcome.

Respectfully submitted,

Wayne Pollock, *Councilor*
Eighth District

NINTH COUNCILOR DISTRICT

Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Siskiyou, Solano, Sonoma, and Trinity Counties

To the President and the House of Delegates:

During the year 1949, Sonoma, Napa and Solano county medical societies were visited more than once. The northernmost counties were not visited. The following meetings were outstanding:

May 19, 1949, the Sonoma County Society held a public meeting at the Green Lantern, on the highway some eight miles out of Santa Rosa, at night. Some 200 dentists, lawyers, laboratory workers, undertakers, druggists, businessmen and physicians met for the purpose of discussing mutual problems, such as the welfare state and political medical and hospital services. Mr. Hartley Peart was the speaker of the evening and his remarks were very well received. Dr. Murray also made a report on legislative matters. Your Councilor feels there should be more of such gatherings in 1950.

June 22, 1949, a public meeting was held at the Napa Country Club under the auspices of the Napa County Medical Society. Businesmen as well as professional people, to the number of 150, gathered for cocktails and dinner. Dr. M. M. Booth of St. Helena, president of the society, conducted the meeting. The principal speaker was Albert C. Agnew, counselor-at-law, of San Francisco, who chose as his subject "The America of Tomorrow." He spoke plainly of the trend toward a planned economy and how the socialization of medicine fits into the program. Your Councilor followed with an address entitled "Socialized or Political Medicine in Great Britain under Atlee's Government." Both talks were recorded and Mr. Agnew's was broadcast that evening over the local station. The audience seemed much impressed by the subject matter presented.

August 11, 1949: Sonoma County again entertained the doctors of Solano, Napa and Marin counties, an annual district meeting, at the Santa Rosa Golf and Country Club. A golf tournament preceded the dinner meeting and all who played enjoyed the excellent weather and the club itself. A spirit of good fellowship was very evident and this carried over to the dinner which followed. There were approximately 137 who stayed for dinner and for the program which followed, M.C.'d by Dr. D. H. Murray of Napa. During the course of the evening he called upon the assemblymen and senators of the counties represented and also upon Senator Burns of Fresno County, who made the principal address. The gist of the remarks by our legislators was to the effect that they were not in sympathy with a "planned economy" and the type of medical practice that goes hand in hand with such a program. Our President, R. Stanley Kneeshaw, contributed to the evening with some very pointed remarks about compulsory medical and hospital services and showed how unfavorable these services were as compared to the voluntary plan which we, as a profession, are helping to promote.

December 13, 1949: At the request of the Solano County Medical Society, your Councilor installed the regularly elected officers for the year 1950 with appropriate remarks. The installation followed a buffet supper and this was in turn followed by a josh Christmas party. The evening was very satisfying to all present because the spirit of friendliness of the occasion was so evident. Some rather interesting humorous stories were told by both old and new members.

December 14, 1949: At the invitation of the program committee of the Napa County Medical Society (Dr. George Dawson, chairman) it was again my pleasure to install the duly elected officers of that society for the coming year. A social hour and a turkey dinner preceded the installation ceremony. Your Councilor made it a point in his remarks that it was the function and the duty of the incoming corps of officers to be active in support of the program of both the California and the American Medical Associations and that there was no such thing as a "passive attitude" and that we needed and required strong personalities for the year 1950 with a view to defeating any and all legislation which would tend to regiment the public and the medical profession. Dr. D. H. Murray, Trustee of the A.M.A., made a very concise report of the activities in Washington, D. C., at the recent mid-winter meeting of the House of Delegates and the clinical and professional meeting of the General Practice membership. It is urged that a greater number of general practitioners attend these mid-winter sessions.

It has again been a pleasure for me to serve my district to the best of my ability during the year 1949.

Respectfully submitted,

John W. Green, *Councilor,*
Ninth District

REPORTS OF COUNCILORS-AT-LARGE

To the President and the House of Delegates:

As one of your Councilors-at-Large I have regularly attended the meetings of the Council and Executive Committee the past year. Inasmuch as the minutes of these meetings have been duly published in California Medicine, it is unnecessary to comment on them further. Suffice it to say it is my impression that the Council, as now constituted, has functioned effectively in dealing with the many problems which have arisen during the year.

Respectfully submitted,

Sidney J. Shipman, *Councilor-at-Large*

To the President and the House of Delegates:

As one of your Councilors-at-Large, I have attended all meetings of the Council since my appointment.

My chief interest is to work to keep medicine at its present high level.

It is my desire to continue to carry on an aggressive approach, as has been outlined by our societies, to continue opposition to state or socialized medicine in any form.

Respectfully submitted,

Francis E. West, *Councilor-at-Large*

To the President and the House of Delegates:

The Council, working with the Board of Medical Examiners, sponsored a number of improvements in the Business and Professions Code at the last meeting of the legislature. As a result, satisfactory anti-rebating legislation and some of the other proposed changes are now law.

Disappointingly, an "omnibus" bill, which easily passed both houses of the Legislature, was pocket vetoed by the Governor. Among other things, this bill would have outlawed street-corner blood pressure readers, would have made practice of medicine without a license a high misdemeanor on the first offense, and a felony on the second offense (as has been the case with dentistry for a number of years), and would have defined more clearly the status of psychologists in relation to medical practice.

Respectfully submitted,

Wilbur Bailey, *Councilor-at-Large*
Vice-President, State Board of Medical Examiners

To the President and the House of Delegates:

Having completed my initial year as Councilor-at-Large, I am more than ever convinced of the thoroughness of your controlling body. I have attended all Council meetings and can report that all matters are seriously discussed and considered before being acted upon.

The range of influence of our society enters practically every phase of the life of our state.

It appears that our position has been more than maintained in the year 1949 and the prospects for 1950 seem brighter, providing that we stand united for the principles to which we are dedicated.

Respectfully submitted,

Ben Frees, *Councilor-at-Large*

To the President and the House of Delegates:

As Councilor-at-Large I have attended all meetings of the Council of the California Medical Association. I have worked on several committees, and have taken part in many discussions which came before the Council.

I have attended the Council meetings of the Alameda County Medical Association, to be able to better correlate state and county organizations.

Respectfully submitted,

H. Gordon MacLean, *Councilor-at-Large*

To the President and the House of Delegates:

I have attended all the meetings of the Council, several additional committee meetings, county association meetings, the Rural Health Conference held in October at Sacramento, and the past three or four meetings of the State Advisory Hospital Council as an invited, non-voting participant.

Congressional and state legislation making money available to assist in construction of hospitals has stimulated widespread activity in hospitals by both local governmental units and by private enterprise, particularly as non-profit associations.

It is a planned program of hospital construction. The Department of Public Health is doing an excellent job of determining allocations—according to the plan. It may not be economic sense. How easy it is to find public funds to build. How difficult it will be to maintain these institutions without help of public funds.

There is the possibility that some political significance may develop in the hospital medical picture in the future in view of the government money involved.

Some of our county hospitals appear to be definitely in the business of supply hospital and medical service to all comers—able to pay as well as indigent—at over-all rates apparently not conducive of private or non-profit institutions' growth.

If we must have counties or hospital districts supplying hospital and medical service, I believe more people should be encouraged to pay their own way by having to beard social service departments with authority to determine financial responsibility.

Respectfully submitted,

C. V. Thompson, *Councilor-at-Large*

REPORTS OF COMMITTEES

EXECUTIVE COMMITTEE

To the President and the House of Delegates:

Your Executive Committee has held regular meetings approximately mid-way between Council meetings, and also such special meetings as were necessary to act upon matters which needed prompt attention. The minutes of the Executive Committee have been presented to the Council for approval and have been subsequently published in California Medicine.

All the members of the Executive Committee have been most attentive and cooperative in their work.

Respectfully submitted,

H. Gordon MacLean, *Chairman*

COMMITTEE ON ASSOCIATED SOCIETIES AND TECHNICAL GROUPS

To the President and the House of Delegates:

There have been no meetings of the Committee during the past year and no communications have reached me as chairman of the Committee from the California State Nurses' Association or from any other society or technical group.

Respectfully submitted,

Robert A. Scarborough, *Chairman*

AUDITING COMMITTEE

To the President and the House of Delegates:

The Auditing Committee has carried out its duties as described in the By-Laws. An audit by a certified public accountant showed the books to be in good order.

The committee has also made recommendations to the Council concerning the 1950 budget.

Respectfully submitted,

H. Gordon MacLean, *Chairman*

COMMITTEE ON HEALTH AND PUBLIC INSTRUCTION

To the President and the House of Delegates:

The Committee on Health and Public Instruction has attempted to keep in touch with health activities concerning practicing physicians, public health officials, and the general public. While no formal meetings have been held during the past year, the Committee stands ready at all times to assist the Association in the field of health education.

Respectfully submitted,

Orrin S. Cook, *Chairman*

COMMITTEE ON HISTORY AND OBITUARIES

To the President and the House of Delegates:

History: As so often happens, it has been found that the collection of historical data concerning the early days of California Medical Association, founded in 1856, is a somewhat slow process. The Historian, George H. Kress of Los Angeles, has been working at old newspaper files and medical journals of that period in efforts to piece together a more detailed story of that time than our Association now possesses. Los Angeles, Alameda and one or two other county units have gotten together in printed form narratives of the past days and activities. In Sacramento J. Roy Jones is preparing and expects to have ready shortly for the printers a "History of Medicine and Medical Men in Sacramento County from 1849 to 1949."

The Committee on History joins with the Historian in asking county medical societies to gather together their records and minute books and other references. The Historian, in due course, will ask the loan of these from which skeleton historical outlines may be compiled by him, to be sent to the respective county societies for further elaboration. Our California Medical Association's place in the medical world of the present day demands we be able to tell somewhat the story of our forebears, who, under sternest conditions, carried on the initial battles in promotion of public health, medical education and licensure and other interests and activities in which doctors of medicine have professional and civic responsibilities.

Obituaries: The records of the California Medical Association, as of January 10, 1950, show that during the past year death has claimed 105 California doctors. The obituary of the most distinguished of these, Ray Lyman Wilbur, chancellor of Stanford University, Past President of the American Medical Association and Secretary of the Interior under former President Herbert Hoover, appeared in the August issue of CALIFORNIA MEDICINE. Death also claimed, on November 8, 1949, a Past President of the California Medical Association, Morton R. Gibbons, Sr., chairman of the California Medical Association Committee on History and Obituaries. Dr. Gibbons was the fourth member of the Gibbons family who became President of the California Medical Association: Dr. H. Gibbons, Jr., in 1857; H. Gibbons, Sr., President in 1871; W. P. Gibbons, President in 1885, and Morton R. Gibbons, Sr., in 1929. Morton R. Gibbons, Sr., lived up to the traditions of his family in loyal service to the profession he loved.

ROBERT A. PEERS, *Chairman, Pro. Tem.*

COMMITTEE ON HOSPITALS, DISPENSARIES, AND CLINICS

To the President and the House of Delegates:

The Committee has endeavored to provide assistance and information to counties and groups of physicians where hospital problems have arisen. Contact has been maintained with the application of the Federal and State hospital assistance acts throughout the state. Information has been collected and memoranda compiled in regard to the various hospital developments as requested by the Council of the C.M.A. and independently.

The Committee met January 27, 1950, in joint session with the council on professional practice of the Association of California Hospitals and the Special Committee on Hospitals of the Council of the California Medical Association, to discuss the problem of medical staff by-laws for district hospitals. A draft of proposed by-laws and standards for district hospitals—small, medium and large classifications—is to be drawn up. These by-laws are to be worked out jointly by your committee and the hospital association's council on professional practice, submitted to the respective councils of the California Medical Association and the Association of California Hospitals for action, and made available to the district hospitals and their medical staff members. Amendments to the District Hospital Law necessitate continued interest and activity by this committee.

Respectfully submitted,

CARROLL B. ANDREWS, *Chairman*

COMMITTEE ON INDUSTRIAL PRACTICE

To the President and the House of Delegates:

For the past year the outstanding problem confronting Industrial Practice has been the final acceptance of a fee schedule. The "1949" schedule proposed by C.M.A. was never accepted by insurance carriers. Actuarial figures submitted indicate that an increase in workmen's compensation insurance premium rates would be necessary before such a large increase in fees could be paid. The reasonableness of our 1949 schedule was never completely denied but in order to achieve such an increase it would require approximately two or three years of gradual adjustment because of the mechanics set up by the Rating Board and the Insurance Commissioner. Premium rates are based on several years' actual experience, not including the current year.

Since the completion of the 1949 C.M.A. schedules, further negotiations have been carried on with insurance representatives by a committee of the Council and later by the Executive Committee of the Council. A compromise schedule acceptable to both the C.M.A. and the insurance companies will undoubtedly be forthcoming.

In addition to the new schedule there has been established a permanent cooperating group representing both physicians and insurance companies, to which all problems involving mutual interest can be referred. This cooperative group will continue fee schedule study, and revision will be submitted from time to time. It is planned to adopt more total or flat fees for those procedures that lend themselves to such treatment. This would eliminate the time spent in checking individual calls and be a definite saving in office routine, both to doctors and insurance companies.

Dr. Packard Thurber's book on "Determination of Permanent Disabilities" is in process of being published under the sponsorship of the C.M.A. and will be an outstanding contribution to industrial practice. This book has been officially accepted by the Industrial Accident Commission in California and undoubtedly will be universally accepted by commissions in all other states.

Respectfully submitted,

DONALD CASS, *Chairman*

COMMITTEE ON MEDICAL DEFENSE

To the President and the House of Delegates:

The Committee on Medical Defense has had no meetings during the past year, and no communication or business has been referred to the committee for action.

Respectfully submitted,

H. CLIFFORD LOOS, *Chairman*

COMMITTEE ON MEDICAL ECONOMICS

To the President and the House of Delegates:

The Committee on Medical Economics has continued to carry out its work concerning the individual physician-patient relationship. Under the direction of Mr. Rollen Waterson, executive secretary of the Alameda County Medical Association, working through its Bureau of Medical

Economics, procedures of many doctors' offices have been investigated. This work is practically completed and the results of this investigation will soon be available.

The accounting department of the Bureau of Medical Economics of the Alameda County Medical Association handles the accounts of hundreds of doctors in Alameda County. It is now possible to list a large number of don'ts for doctors. The committee feels that this study of the individual physician-patient relationship, so far, is not complete. The negative side has been studied but not the positive side. It is believed necessary to make a study of the psychological factors involved in the individual physician-patient relationship. An attempt must be made to determine why, given two doctors of good ability and training, one may be successful in the practice of medicine and the other unsuccessful. A psychological study is needed.

Your committee is having a well-known business psychologist carry on a psychological analysis of the individual physician-patient relationship. It is believed that when this project is completed it will be possible, together with the work done during the past three years, some of which has already been reported, to furnish information which should be of great value in teaching medical students and doctors how to conduct a successful practice, with good doctor-patient relations.

When this work is finished it will immediately be submitted to the Council.

Respectfully submitted,
H. Gordon MacLean, *Chairman*

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL INSTITUTIONS

To the President and the House of Delegates:

There have been no meetings of the Committee during the past year and no business or communications have been referred to the Committee for action. One problem was referred to the Committee by the Council during the year and report was made to the Council.

Respectfully submitted,
L. R. Chandler, *Chairman*

COMMITTEE ON ORGANIZATION AND MEMBERSHIP

To the President and the House of Delegates:

It is customary for the Committee on Organization and and Membership to make an annual report to the House of Delegates of the California Medical Association and this year the report can be quite an optimistic one.

As of December 31, 1949, 10,002,* or about 80 per cent of the potential membership among the physicians of California, are members of the California Medical Association.

The current directory of the Board of Medical Examiners shows a total of 20,216 licensed physicians as of the close of 1949. Of this number, 5,136 are listed as residing outside the State of California, leaving 15,080 resident licentiates.

At one time a directive was sent to the committee to investigate the possibility of increasing the state association membership. When the membership was broken down and compared with the number of men licensed in the state, an 80 per cent membership of the total was considered a pretty fair percentage. The American Medical Association lists about 185,000 physicians in the country, of whom 140,000 are A.M.A. members. That means that the national average is about 75 per cent of the potential. It must be borne in mind that of the 2,580 licentiates who are not members, a good portion represents men who have applied for membership but have not been elected. The number also includes men who have been members and who have been expelled or dropped from membership for other reasons. It also includes a number of recent medical school graduates to whom the payment of annual dues might constitute a financial hardship but who intend to become members when their practices build up.

The Association membership increased 11.8 per cent during the year 1948 and 12.77 per cent during the year 1949. These figures represent the same increase in membership as evidenced in the general population increase in the state during these years.

Herewith is appended a resume of membership by counties given out by the executive office of the California Medical Association.

Respectfully submitted,
Carl L. Mulfinger, *Chairman*

C.M.A. County Society Membership Totals For Calendar Year 1949

County Medical Societies	*Membership in 1948*	*Number Licensed Physicians (1948 Directory)*	*Membership in 1949*	*Number Licensed Physicians (1949 Directory)*
Alameda	733	1,134	774	1,227
Butte-Glenn	43	67	52	67
Contra Costa	104	159	120	181
Fresno	191	204	206	232
Humboldt	44	57	41	60
Imperial	26	33	31	39
Inyo-Mono	8	12	11	15
Kern	103	168	116	182
Kings	26	32	24	30
Lassen-Plumas-Modoc	16	25	18	27
Los Angeles	3,956	6,316	4,261	6,672
Marin	65	101	71	115
Mendocino-Lake	23	38	28	44
Merced-Mariposa	34	58	39	62
Monterey	91	124	105	142
Napa	47	72	44	76
Orange	181	253	202	278
Placer-Nevada-Sierra	39	66	47	74
Riverside	99	156	110	173
Sacramento	219	261	238	292
San Benito	6	9	7	9
San Bernardino	219	281	227	306
San Diego	444	685	473	731
San Francisco	1,281	2,116	1,319	2,179
San Joaquin	138	175	142	194
San Luis Obispo	36	48	41	55
San Mateo	149	211	173	273
Santa Barbara	138	188	137	177
Santa Clara	292	410	303	431
Santa Cruz	53	76	60	83
Shasta-Trinity	14	29	20	34
Siskiyou	11	22	15	19
Solano	61	98	60	103
Sonoma	84	108	95	115
Stanislaus	66	90	69	99
Tehama	8	11	9	13
Tulare	73	78	72	88
Ventura	58	101	62	110
Yolo	24	27	26	30
Yuba-Sutter-Colusa	37	36	37	43
Totals	9,240	14,135	9,885	15,080

COMMITTEE ON POSTGRADUATE ACTIVITIES

To the President and the House of Delegates:

During the past year your committee has met once every two months with usually a full attendance of all the members.

Your committee wishes to thank the Council of the California Medical Association for its cooperation and understanding of the problems peculiar to California and for making available funds, clerical help, and office space in order to carry on this project.

---

*Including associate members.

We have endeavored to bring up-to-date instruction to many of the physicians who are widely separated from the metropolitan areas and medical teaching centers. Our problem has not changed as to its vastness and its needs.

We have continued to use the services of Dr. Carroll B. Andrews as Director of Postgraduate Activities up till February 1, 1950. However, he found that the demands of his private practice made it impossible to continue the work as director and as a result he tendered his resignation to the Council on January 14, 1950, which was accepted with regret as of February 1, 1950.

The Council then considered the application of Dr. C. A. Broaddus of Stockton for the position of Director of Postgraduate Activities. Dr. Broaddus came highly recommended and had successfully organized and conducted the Stockton Postgraduate Study Club for the past 15 years. His application was accepted unanimously by the Council as of February 1, 1950.

To assist Dr. Broaddus in his work a stenographer-secretary and an office room in Stockton were authorized.

For the year 1950-1951 a change of policy is contemplated. We plan to conduct five clinical institutes, one in each of five geographical districts of the state outside of the teaching centers of San Francisco and Los Angeles. We propose to have each of the five medical schools conduct one of these institutes with teachers from its faculty; expenses and honoraria will be guaranteed by your Committee.

An advisory committee is in the process of being formed along the lines indicated in our 1949 report. They will meet with your Committee during the Annual Session.

We are continuing our membership in the Associated States Postgraduate Committee.

We shall continue to encourage and assist various county medical associations and their committees in their postgraduate activities at the county and local levels whenever opportunity offers.

We request that the Council of the California Medical Association be directed to continue the allocation of funds for carrying on the policies as adopted by your Committee and to make available to the members, especially to those of the non-metropolitan areas, such postgraduate opportunities.

Respectfully submitted,
John C. Ruddock, *Chairman*

COMMITTEE ON PUBLICATIONS

The Committee feels that the publication and distribution of the official Journal of the Association gives a maximum benefit to the largest possible number of members of the California Medical Association.

The scientific and organization work of the Association is presented in the best possible manner.

Respectfully submitted,
George I. Dawson, *Chairman*

COMMITTEE ON SCIENTIFIC WORK

To the President and the House of Delegates:

The Committee on Scientific Work held two meetings during the year, and two meetings with the section officers.

The 1950 scientific program will be modeled along the lines of the two previous meetings, with a relatively free afternoon on the second day of the meeting.

The paging system inaugurated in 1949 will be continued. It is essential that members desiring messages during the Annual Session notify their own office secretaries as to their probable location in order to facilitate paging.

Members should wear badges at all times during the Annual Session.

An increased amount of Scientific Exhibit space will be available in 1950.

For the information of new members, the following *policy regarding meetings of other medical organizations* during the time of, and in conjunction with, the Annual Meeting of the California Medical Association is reprinted:

a. Medical organizations wishing to hold meetings concurrent with the Annual Meeting of the California Medical Association are requested to plan such meetings so that they do not conflict with the scientific or other programs of the state medical organization. This will usually entail the special society holding its meeting *prior to or subsequent to* the three and one-half days required for the state meeting.

b. Medical organizations wishing to hold a short one- or two-hour organizational meeting *during* the C.M.A. meeting are welcome to do so, with due announcement in the Journal and program, provided no formal scientific session is planned which might conflict with the regular session.

c. Scientific papers prepared by C.M.A. members for presentation in connection with the Annual Meeting should be offered to the appropriate section of the C.M.A. and thereby be available for publication in the state Journal.

The matter of *adequate press coverage* of the annual session was discussed at length during the year. The following general plan was decided upon:

All press arrangements will be under the direction of the C.M.A. Press Officer (Mr. Edwards).

In order to facilitate his work each scientific section has agreed to appoint a special press aide, whose duties may be appreciated from the following information sheet, which was sent to all aides prior to the meeting:

INFORMATION FOR SECTION PRESS AIDES

1. Requirements for press coverage of C.M.A. Scientific Meeting.
    a. Typewritten copies of all papers should be in the C.M.A. office at least six weeks prior to meeting (March 18).
    b. Abstracts of those papers, in simple language, preferably prepared by the author himself, should accompany each paper.
    c. The C.M.A. office will mimeograph each abstract prior to the meeting. Complete copies of some papers may be prepared.
    d. The press aide may be asked the teaching or hospital staff connections of authors in his section; he should be prepared accordingly.
    e. Reporters may need to interview some speakers in order to clarify items. Each scientific section press aide should keep the press room notified of his whereabouts during the Convention. The press aide may be asked to attend the press room between 9 and 11 on certain mornings, bring speakers to press room at appointed time, etc.

2. General information.
    a. The C.M.A. Press Relations Officer (Mr. Edwards) will send programs of the meeting together with brief identification of the more important speakers, etc., to all major newspapers in the convention area about a week prior to the meeting.
    b. A special press room will be provided (inquire at registration desk).
    c. The local medical society will provide physicians for attendance at the press room daily from 9 to 11 during the convention, who may call on a member of the Committee on Scientific Work or a section press aide for assistance.

d. Please explain to guest speakers and other persons whom the reporters wish to interview that interviews are usually made in the *morning* and are often essential for really "live" stories.

3. Special information.

There will be a "Meet the Press" luncheon, Saturday, April 29, at Hotel del Coronado. In addition to the press, and Mr. Edwards, it is planned to have a representative of the officers of the C.M.A., the Committee on Scientific Work, the local press committee, and as many of the section press aides as possible in attendance.

Respectfully submitted,
L. Henry Garland, *Chairman*

REPORT OF EDITORIAL BOARD CALIFORNIA MEDICINE

To the President and the House of Delegates:

During the past year, one new section, the Section on Allergy, was added to the Editorial Board, and the former section on Neuropsychiatry was renamed the Section on Psychiatry and Neurology. Dr. Frank G. Crandall, Jr., of Los Angeles and Dr. Samuel H. Hurwitz of San Francisco were appointed by the Council to represent the Section on Allergy. Dr. Karl M. Bowman of San Francisco and Dr. John B. Doyle of Los Angeles represent the section on Psychiatry and Neurology as they did the former section on Neuropsychiatry.

No formal meetings of the Executive Committee of the Editorial Board were held during the year.

The members of the Editorial Board are:

Chairman of the Board:
Dwight L. Wilbur, San Francisco

Executive Committee:
Albert J. Scholl, Los Angeles
H. J. Templeton, Oakland
Edgar Wayburn, San Francisco
Dwight L. Wilbur, San Francisco

Allergy:
Frank G. Crandall, Jr., Los Angeles
Samuel H. Hurwitz, San Francisco

Anesthesiology:
William B. Neff, San Francisco
Charles McCusky, Los Angeles

Dermatology and Syphilology:
Paul Foster, Los Angeles
H. J. Templeton, Oakland

Eye, Ear, Nose and Throat:
Frederick C. Cordes, San Francisco
Lawrence K. Gundrum, Los Angeles
A. R. Robbins, Los Angeles
Lewis Morrison, San Francisco

General Medicine:
Maurice Sokolow, San Francisco
O. C. Railsbach, Woodland
Edgar Wayburn, San Francisco
John Martin Askey, Los Angeles
W. E. Macpherson, Los Angeles

General Surgery:
Frederick L. Reichert, San Francisco
C. J. Baumgartner, Beverly Hills

Orthopedic Surgery:
Frederic C. Bost, San Francisco
Hugh Jones, Los Angeles

Thoracic Surgery:
John C. Jones, Los Angeles
H. Brodie Stephens, San Francisco

Industrial Medicine and Surgery:
Rutherford T. Johnstone, Los Angeles
John E. Kirkpatrick, San Francisco

Plastic Surgery:
George W. Pierce, San Francisco
William S. Kiskadden, Los Angeles

Obstetrics and Gynecology:
Daniel G. Morton, San Francisco
Donald G. Tollefson, Los Angeles

Pediatrics:
E. Earl Moody, Los Angeles
William G. Deamer, San Francisco

Pathology and Bacteriology:
Alvin G. Foord, Pasadena
Alvin J. Cox, San Francisco

Psychiatry and Neurology:
Karl M. Bowman, San Francisco
John B. Doyle, Los Angeles

Radiology:
R. R. Newell, San Francisco
John W. Crossan, Los Angeles

Urology:
Lyle Craig, Pasadena
Albert J. Scholl, Los Angeles

Pharmacology:
Hamilton H. Anderson, San Francisco
Clinton H. Thienes, Los Angeles

Public Health:
George Uhl, Los Angeles
Charles E. Smith, San Francisco

Respectfully submitted,
Dwight L. Wilbur, *Chairman*

PHYSICIANS' BENEVOLENCE COMMITTEE

To the President and the House of Delegates:

Your committee has been considering plans for cooperation with the Los Angeles County Physicians' Aid Association for the care of our needy who require a home or institutional care. A preliminary report has been rendered to the Council of the C.M.A. which considers several means of accomplishing this purpose for needy residents of other parts of the state. Study of the project will continue because it is felt that the supplemental aid by our Benevolence Fund is very inadequate in some cases and the institution proposed at Los Angeles would provide a way for complete and proper care for some of our cases.

At the present time, only $1.00 per active member is deducted from our annual dues for benevolence purposes. The money thus obtained is wholly inadequate for anything but the continuance of the sketchy supplemental aid so far furnished. Your committee would recommend that an increase in the allocation of funds be made as soon as facilities for complete care are provided. We believe this could be left to the discretion of the Council as to the amount needed.

A review of the receipts and expenditures of the Benevolence Committee follows:

Receipts for calendar 1949 totaled $13,214.56, of which $12,418.82 was in direct contributions and $795.74 was in earned interest on securities and savings account balances. Of the direct contributions, the Woman's Auxiliary to the California Medical Association made a new record high contribution of $2,631.07, for which the Benevolence Committee is deeply grateful and takes this opportunity to express its thanks. The balance of the direct contributions came from the Association's treasury at the rate of $1 per year per active member.

Expenditures for the year totaled $8,277.94, of which $252.95 represented premium paid on securities purchased. The balance of the expenditures, $8,025, was paid out in benefits to physicians, their wives and families. A total of $6,000 was distributed through the Los Angeles County Physicians' Aid Association, and $2,025 was disbursed from the Association offices to recipients in other counties.

At the end of 1949, the Benevolence Fund showed total assets of $32.377.89, of which $22,000 was in U. S. Treasury bonds and $10,377.89 in commercial and savings bank accounts. Under the present program, cash on hand should carry the fund through 1950. which would permit the addition of all 1950 contributions to the permanent fund.

Respectfully submitted,
A. E. Anderson, *Chairman*

COMMITTEE ON PUBLIC RELATIONS

To the President and the House of Delegates:

The Committee on Public Relations is composed of chairmen of standing committees, all named in the Constitution and By-Laws as ex-officio members. The committee serves as a stand-by group under the Council, prepared to meet and serve when and if occasion arises. In 1949, as in the past few years, the Association's program of public relations has been undertaken by outside counsel, under plans approved by the Council and the House of Delegates. The Committee on Public Relations, accordingly, has been inactive during this period.

Respectfully submitted,
JOHN HUNTON, *Director*

ADVISORY PLANNING COMMITTEE

To the President and the House of Delegates:

The Advisory Planning Committee has continued to meet during 1949, on the call of the chairman or on request of the members, to discuss matters which might be placed before the Council for consideration. All such matters are reported in the Council minutes, as published in the Journal. The action of the House of Delegates in creating this committee called for its decisions to be of an advisory nature only, with reports to be made to the Council, and this policy has been followed.

Respectfully submitted,
JOHN HUNTON, *Chairman*

ANNUAL REPORT OF THE CANCER COMMISSION

To the President and the House of Delegates:

The Cancer Commission has conducted an extensive program of cancer conferences throughout the state during the past year. At the beginning of the year the opportunity of a conference was offered each county medical society in the non-metropolitan areas. Thirty-one such conferences have been held, in several instances combining two or more county societies. Fifty-two members of the California Medical Association have participated in these conferences as guest speakers. The expense has been shared by the California Medical Association and the California division of the American Cancer Society. It is estimated that about 53 per cent of the available members in the non-metropolitan areas have attended these conferences.

The program for 1950 is to use 15 regional conferences intended to cover the entire state. It is proposed to make these conferences largely clinical with the actual presentation of cases and discussion of the diagnosis and treatment.

The Cancer Commission recognizes the fine work that Dr. Hook, the medical director, has done in the preparation and conduct of the cancer conferences and extends its appreciation for the cooperation of the county medical societies and the California division of the American Cancer Society in this program.

Refresher courses in cancer for practicing physicians will be held in February in Los Angeles and Oakland. The national office of the American Cancer Society has sponsored these two courses and paid the expenses of three eastern speakers for these programs.

The present edition of "Cancer Commission Studies" has been completed and is ready for publication as a California Cancer Manual. Grateful recognition is given to the authors of these studies and to the editorial committee consisting of Drs. Dobson, Berne, Pflueger and Kenney for the work that they have done over the past two years.

At the present time there are about 62 tumor boards in California. The medical director of the Cancer Commission is visiting these boards to assist them where possible and to stimulate the formation of new boards in approved hospitals where there are adequate medical personnel.

The Cancer Commission is maintaining its close cooperation with the California division of the American Cancer Society, and members of the commission are taking an active part in the board of directors and executive committee and all other committees at the state level. The commission commends the exceptional lay leadership in this organization for their rare judgment and intensive work and for their fine cooperation with the medical profession.

County branches of the American Cancer Society have been organized in all of the southern counties and in most of the larger northern counties. Before a county branch can be organized it must have the approval and cooperation of the county medical society for, in each instance, the medical policy and projects of the county branch must have the full approval and endorsement of the medical profession. The state division recognizes that cancer control is both a medical and a community problem and that any county branch will succeed in direct proportion to the interest and cooperation of the county medical society. The function of the county branch in making the public cancer-conscious and sending potential cancer patients early to their own physicians requires the best and most energetic medical leadership in any county for its accomplishment. The Cancer Commission urges the cancer committee of each county medical society to give continued untiring support to the county branch of the American Cancer Society. The lay educational program is bringing definite and measurable results.

Two pre-convention conferences will be held on April 29, sponsored by the Cancer Commission. The conference on Microscopic Tumor Pathology will be limited to the study of bone and joint tumors. Louis Lichtenstein will be the moderator. E. M. Butt, chairman, and Howard Ball, secretary, are preparing the material for this conference. Members of the C.M.A. who are interested in the surgical pathology of bone tumors may avail themselves of this opportunity. Microscopes will not be needed. The pre-convention conference on radiology is being prepared by Earl R. Miller and R. F. Niehaus. This conference is also available to members of the C.M.A.

The commission sincerely appreciates the cooperation and support of the President and of the Council in their effort to represent the California Medical Association in the cancer control program.

Respectfully submitted,
LYELL C. KINNEY, *Chairman*

C.M.A. BLOOD BANK COMMISSION

To the President and the House of Delegates:

The year 1949 was a busy one for this committee. Four new commission members were appointed: John Laurence of Los Angeles, Robert Newell of Fresno, Thomas O'Connell of San Diego and L. N. Osell of Bakersfield. A well-attended Blood Bank Commission meeting was held in Los Angeles in May 1949. Clarification of the over-all state system was accomplished and plans made to implement and speed needed blood bank expansion. An operational program for the future was also decided.

Accomplishments:

1. Assistance to new blood banks.

a. Operating: (1) Sonoma County Community Blood Bank in Santa Rosa, Dr. Owen Thomas, medical director; (2) Valley Blood Bank in Fresno, Dr. Robert Newell, medical director. Both banks are serving their own communities and outlying areas.

b. Organization Stage: (1) Tri-Counties Blood Bank, to be located in Santa Barbara, serving San Luis Obispo, Santa Barbara and Ventura counties.

2. Assisted State Department of Public Health, Biologics Division, with the revision of technical standards for blood banks.

3. Compiled information on all California non-profit community blood banks regarding their policies and plan of operation. The information was conveyed to all parties interested in starting blood banks.

4. Obtained monetary donation to further our blood program.

5. California Medical Association's plan for unity with American Red Cross national blood program was submitted by letter to General George C. Marshall, president of the American National Red Cross, in November 1949.

6. Sub-committee, chairmanned by DeWitt K. Burnham, worked with representatives of certain banks to establish the following: (a) Central clearing house for inter-blood bank transactions and actual blood unit exchanges between banks. (b) Adoption of new blood bank administrative and technical procedures.

7. Meetings were held with local county medical society representatives in Paso Robles, San Luis Obispo, Santa Barbara, Los Angeles, Bakersfield, Fresno, Sacramento, Santa Rosa and San Francisco. Conferences with these society members were of definite assistance to the state blood bank program.

Publicity:

1. Many physicians, civic leaders and interested persons, residing in the United States and other countries, were informed of the California Medical Association blood bank plan and details of blood bank operation. The volume of correspondence was heavy.

2. Articles were published in the California Medical Association Journal and *Bulletin of the San Francisco County Medical Society.*

3. Papers were read before the American Association of Blood Banks meeting in Seattle, Washington, and the West Coast Obstetrical and Gynecological Conference in San Francisco.

4. Medical article for the journal *Lancet* is being prepared at the request of the American Association of Blood Banks, also one for *Hospital Topics.*

Future Plans:

1. A meeting with commission members and the administrative and technical representatives of all non-profit community blood banks for further integration and coordination of our blood bank system is planned for February 1950.

2. An exhibit is planned for the forthcoming American Medical Association Convention.

3. An exhibit is planned for the California Medical Association Convention.

Your commission thanks the council for its loyal support. We also pay tribute to the numerous county medical societies for the outstanding initiative and farsightedness they have shown by adopting the non-profit community blood bank program. The members of these societies have the satisfaction of knowing they are providing adequate blood coverage, not only to members of their communities, but to other California residents as well. The various members comprising the Blood Bank Commission have been very sympathetic and intelligent, and I consider it my good fortune to have had the privilege of working with them.

Respectfully submitted,

JOHN R. UPTON, *Chairman*

COMMITTEE ON INDUSTRIAL HEALTH

To the President and the House of Delegates:

The Committee on Industrial Health has continued its study of the problem raised by the failure of "The Standing Orders for Industrial Nurses" prepared by the Council of Industrial Health of the American Medical Association to win the endorsement of the Council of the C.M.A.

In our report of a year ago, we indicated that we felt the problem was somewhat peculiar to California. Our further explorations have caused us to alter this belief, as we have found that confusion on this subject is by no means limited to our own state.

In our report of last year, we expressed "no opinion as to whether the proper long-range solution of this problem will lie in the endorsement of any set of Standing Orders for Industrial Nurses proposed to date or in legislation which would modify either the existing practice acts as applied to nurses or physicians, or by some other means yet to be explored."

We are very happy to report that the interested groups of nursing organizations and industrial physicians, both in the state and at the national level, seem no longer inclined to view this problem as limited to any set of "standing orders," but have realized that the over-all problem is one of adequate medical supervision for nurses in industry. The feeling seems to be spreading generally that a statement based on fundamental principles of medical and nursing practice which emphasizes the need for referral to a physician for those industrially injured who require medical treatment is in order and is demanded. It is anticipated that such a statement of policy will be issued within the next few months—possibly before the annual meeting of the California Medical Society on April 28. Should such be the case, it will be presented to the Council in a supplementary report.

It is anticipated that this statement will, in its final form, represent the policy not only of the American Association of Industrial Nurses who are taking the initiative in the matter, but also, probably, of the American Association of Industrial Physicians and the Council of Industrial Health of the American Medical Association, with the additional possible endorsement of other national organizations.

Through the courtesy of the groups mentioned, your committee has been kept in touch with the context of the rough drafts of this statement, and we anticipate, on the basis of present indications, that in its final form it will prove to be most useful and acceptable, both to the nurses' associations and to the medical societies.

We have carried on joint explorations with the California Nurses' Association's representatives and those of the Western Association of Industrial Nurses, but no action is contemplated on a state level until the national association or associations issue their statement—or unless such a statement unexpectedly fails to materialize.

Other noteworthy activities in the field of industrial health have been a third successful Industrial Health Institute held jointly by the Los Angeles Chamber of Commerce and the

Los Angeles County Medical Association—and other business and professional associations — and the extension of courses and seminars held under the auspices of the University of California, both at Berkeley and at Los Angeles, the State Bureau of Adult Hygiene, the State Nurses' Association, and other agencies. Interest has also been stimulated by the Northern California Association of Industrial Hygienists, who are in their second year.

Passage of the Unemployment Disability Act and its extension to include hospital benefits in California, and a similar unemployment disability act in New York, has generally stimulated greater activity among those interested in industrial health, including lay groups. The Council on Industrial Health in the American Medical Association is appointing a committee to study the further social implications of industrial medicine.

Your committee projects that the field of industrial health is expanding in scope and in magnitude, and urges further study of the problems involved and continued cooperation with the other professional groups concerned.

Respectfully submitted,

Christopher Leggo, *Chairman*

COMMITTEE ON RURAL MEDICAL SERVICE

To the President and the House of Delegates:

The third annual California Rural Health Conference was held in Sacramento October 29, 1949. This conference between the interested farm organizations, the public health representatives, the Department of Education, nursing, hospital, medical and allied groups has materially promoted the purpose of improving the quality and distribution of medical service. The conference has provided a medium of direct exchange of ideas and methods not otherwise available. It has improved the understanding and relationship between the groups. Publication of a condensation of the discussions is planned in order to provide a permanent and available source of information.

Hollis L. Carey of Gridley, one of the members of this committee, served as secretary of the section on "Rural Medical Facilities at the Local Level" at the Fifth National Conference on Rural Health, Kansas City, Mo., February 3, 1950. Your chairman also attended this conference.

Respectfully submitted,

Carroll B. Andrews, *Chairman*

ANNUAL COUNTY MEDICAL SOCIETY REPORTS

FIRST DISTRICT

Imperial, Orange, Riverside, San Bernardino, and San Diego Counties.

John D. Ball, Santa Ana, *Councilor.*

Imperial County Medical Society

Early in the year the County Medical Society unanimously approved and endorsed the proposed tuberculous survey of the adult population of Imperial County by the state tuberculosis association and the county health department.

During the year the C.M.A. arranged for two special meetings for our society; the first, in cooperation with the California division of the American Cancer Society and under the supervision of Dr. Frederick R. Hook, medical director of the Cancer Commission, presented a conference on neoplastic diseases, and the second was a postgraduate seminar under the supervision of Dr. Carroll B. Andrews, director of postgraduate activities, in which papers on "Antibiotics in Clinical Practice" and "Allergy and Hypersensitization" were given. Both meetings gave very timely and informative presentations of the subject material.

The society holds its regular meetings the second Tuesday of each month at 8 p.m. at the Imperial County Hospital. The scientific program is followed by a business meeting.

Ernest Brock, *Secretary*

Orange County Medical Association

Orange County has undertaken a full-scale public relations program with the employment of an executive secretary and the consolidation of all association business activities.

Our program is patterned in its entirety on that developed so successfully by the Alameda County Medical Assotion during the past four years. And to insure its being followed as closely as possible, we have employed, with the full understanding and approval of the council of the Alameda County society, Mr. William Tobitt, who had served that organization for nearly three years as assistant executive secretary under the guidance of Mr. Rollen Waterson.

We established headquarters offices in the Otis Building in Santa Ana on July 1, 1949. Our primary undertaking was to reorganize, along public relations policy lines, the existing Orange County Medical Bureau and to change its name to Bureau of Medical Economics of Orange County. This we accomplished and, by the end of 1949, the bureau was well on its way to being an effective public relations instrument in addition to proving itself an efficient collection service to the county society members.

We also, prior to the beginning of this year, had made arrangements whereby the association telephone would be answered on a 24-hour daily basis in order to supplement existing facilities for securing doctors in an emergency.

Other developmental activities included complete revision of our constitution and by-laws, re-shaping of committees and their jurisdiction and objectives and an outline of things to be accomplished during 1950.

Although we are a small county—203 members as of Nov. 1, 1949—we believe that the program we have undertaken is not too ambitious. With the continued support and enthusiasm of the membership, we, too, hope to be able to publicly advertise shortly that "medical care for all, regardless of inability to pay". is guaranteed in Orange County.

Llewellyn E. Wilson, *Secretary*

Riverside County Medical Association

The annual Doctors and Wives Banquet of the Riverside County Medical Association was held December 10, at the Racquet Club in Palm Springs. Guest speakers of the evening were Dr. Stanley Kneeshaw and Dr. Dwight Murray.

The Association meets the second Monday of each month at the Mission Inn in Riverside. A scientific program is presented, and this is followed by a business session, and light refreshments are served at the conclusion of the evening.

A monthly bulletin of pertinent news and information for the members is published each month.

Cecil J. Lord, *Secretary*

San Bernardino County Medical Society

Membership in the San Bernardino County Medical Society now totals 224 active and eight retired members.

We also have a number of applicants who are being considered for admission.

Interest in the Society is keen and our meetings are extremely well attended. They are held on the first Tuesday of each month, and usually at the San Bernardino County Hospital.

Once a year we are dinner guests at the Patton State Hospital and again at the Loma Linda Sanitarium. These meetings are followed by programs put on by these two institutions.

Our programs have been excellent—the speakers have been of high caliber. The program committee this year is being headed by Hal T. Wilson, M.D.

The secretary is editor of the bulletin, which is not only self-supporting but pays for all the expenses of the society.

The secretary also handles a health and accident insurance program to which a majority of our members subscribe. The insurance thus procured is at a greatly reduced rate and gives our members excellent coverage.

We also have initiated a plan for malpractice insurance which chiefly depends upon our members policing themselves, and this will result in an insurance rate which we hope will continue to decrease. Our entire insurance setup is being revamped so that the new grievance committee can adequately function.

During the past year the Woman's Auxiliary has been reorganized, and their membership is continually growing. The members are taking an active interest in their group and in the problems of the medical profession. The president is Mrs. Carl M. Hadley; vice-president, Mrs. Ray Moose, and secretary, Mrs. Dixie Williams.

The Woman's Auxiliary has as one of its main objectives to help in the tumor clinic. This clinic meets once a week at the County Hospital, and any physician can send his patient to it for consultation without any charge. The Auxiliary helps in presenting the cases to the doctors and keeping the records.

Carl M. Hadley, *Secretary-Treasurer*

San Diego County Medical Society

The year 1949 proved to be exceptionally active for the 540 members and applicants of the San Diego County Medical Society. Particular emphasis was laid upon an intensive public relations program which started with a series of newspaper advertisements guaranteeing medical care to everyone. Community response to this was excellent.

The society also maintained an exhibit at the local county fair during July which stressed the dangers of socialized medicine. The booth was staffed entirely by our members and their wives during the 11 days the fair was in operation.

Our speakers' bureau was active during the year, addressing some 150 different organizations on socialized medicine. It is anticipated that this department will be even more active in 1950.

The doctors' service bureau, a part of our society, has received national recognition for its emergency switchboard service. We have owned and operated our own telephone exchange for the past 14 years and have found it an indispensable public relations tool.

The society has received a great deal of local recognition as a sponsoring agency for our community blood bank, which has issued over 17,000 pints of blood since opening on February 1, 1948.

Last December and January also proved to be very busy, during which time the mass chest survey was held. Our members cooperated in every possible way with other community agencies to make the project a success. Our participation in this city-wide survey brought good public relations dividends.

Our members are looking forward to the 1950 California Medical Association Convention which will be held in San Diego. We hope to make the event so successful that you will want to visit us again as soon as possible.

W. H. Geistweit, Jr., *Secretary*

SECOND DISTRICT

Los Angeles County.

Jay J. Crane, Los Angeles, *Councilor.*

Los Angeles County Medical Association

The Los Angeles County Medical Association in 1949 again enjoyed an exceedingly busy year which presented, as in years past, a need for new activities together with many and varied problems that needed solution, all stemming from the great increase of the population of this area with its concomitant increase in membership of the Association.

The year 1949 closed with a membership of 4,407 active members, 230 associate members and 270 retired members—a total membership of 4,907, compared with a total membership of 2,761 at the beginning of World War II.

Population shifts in Los Angeles County since the end of the war presented a problem that needed solution as soon as possible—a problem relating to equitable representation on the governing bodies of the Association. Before the war two-thirds of the medical population had principal places of practice in metropolitan Los Angeles, the remaining one-third practicing in the county, outside the city of Los Angeles. At the present time more than 50 per cent of our members practice outside the city of Los Angeles. The by-laws committee began its work at the end of the year toward providing equitable representation.

A considerable amount of public relations work has been done by our speakers' bureau, by many meetings with representatives of other professions, and closer contact with official bodies, with Chambers of Commerce, and other organizations.

Numerous meetings have been held with representatives of insurance companies at which meetings the problems incurred in voluntary sickness insurance programs have been taken up, looking forward to solutions that may advance greatly voluntary insurance coverage.

After some years of operation, the indoctrination program for applicants for membership, which was instituted by our Association, has been changed in the belief that this change will create greater goodwill among the new members. Instead of a series of three lectures dealing with malpractice, medical organization, and public relations and ethics, only one lecture now is being given, the lecture on malpractice. The other two lectures have been dispensed with and in their place the Association acts as hosts at a dinner meeting which all applicants are required to attend. At this dinner meeting the problems concerned in public relations, organization and in ethics are freely discussed.

Postgraduate work in the form of weekly breakfast meetings, at which practical scientific papers are presented, are continuing successfully under the guidance of Louis J. Regan, M.D., legal counsel and director of medical relations.

The Physicians' Aid Association has purchased property upon which will be built a home for needy physicians. It is anticipated by the officers of the Physicians' Aid Association that construction of the home will begin during the year 1950.

The Woman's Auxiliary to the Los Angeles County Medical Association has been exceedingly cooperative and active during the year, carrying forward programs of much value to the Association and the profession of medicine generally.

The Los Angeles County Medical Association at the end of the year 1949 is in a most satisfactory financial condition.

R. O. Bullis, *Secretary*

THIRD DISTRICT

Inyo-Mono, Kern, San Luis Obispo, Santa Barbara, and Ventura Counties.

Harry E. Henderson, Santa Barbara, *Councilor.*

Inyo-Mono County Medical Society

We have held our meetings monthly this year, missing only one, despite the long distances some of our members must travel to attend. In several of our monthly meetings we have had speakers from Los Angeles, and these we greatly enjoy.

In November we had a cancer meeting under the auspices of the C.M.A. Cancer Commission, with Dr. Hook present, as well as three men from Los Angeles. We had a good attendance of physicians, dentists and nurses.

The new Northern Inyo District Hospital is now in operation and is a pleasure to all, especially after using makeshift facilities for so many years. The physical plant is beautiful and convenient. The medical staff is now organized. However, we are learning to our sorrow some of the facts of life under government paternalism. Inasmuch as the hospital district asked for and received State and Federal financial aid, we now find that we are forced to accept cultists as full members of the staff.

A hospital district has recently been formed in the southern half of Inyo County, and is operating a previously private hospital in Lone Pine.

The Inyo County Supervisors are now in process of organizing a health department, to employ a full-time health officer, something we have never before had.

Lloyd S. Bambauer, *Secretary*

Kern County Medical Society

In the year 1949 the Kern County Medical Society has achieved success much beyond the expectations of those who are in a position to know the facts pertaining to Kern County. This year has seen a complete changeover from a defensive position to a positive public relations program. It has witnessed the consolidation of the gains of the last two years and the moulding of public opinion to a considerable extent in favor of the society. During the previous two years, the society had been involved in the heat of the Kern General Hospital dispute and then was engrossed in the process of organizing the Kern General Hospital staff. All efforts of the society to the first of 1949 were largely on a defensive basis.

In this year, the achievements of the society may be stated in terms of positive gains along lines that are highly desirable. Public opinion has been greatly improved; press relations, both radio and newspaper, are now as good as anyone may reasonably expect. Such projects as the county fair exhibit have been entered into with the full cooperation not only of the people of the community and its organizations but also of the press.

The medical economics council division of the office has paid its own way through its collection and accounting services. The accounting system developed for the doctors of Kern County has been adopted by one of the major firms specializing in accounting forms as a standard part of the sales portfolio used by their salesmen and, as such, has been distributed throughout the United States. This may be considered to be a good indication of the quality of the system, as the firm has its own patented bookkeeping system for doctors.

The speakers' bureau has been functioning with remarkable success. Speakers have been well received and have repeatedly and clearly stated the case of the doctors against socialized medicine. The Chamber of Commerce and other organizations of the community have learned to refer all matters of importance to the medical profession to the medical society office.

The blood bank committee of the medical society has made sufficient progress to be able to present a concrete program that will temporarily meet the need of the county.

A cancer symposium was brought to the doctors of Kern County through the auspices of the California Medical Association in cooperation with the California division of the American Cancer Society and the Kern County Medical Society.

The editorial committee produced a booklet describing the activities and services of the medical society, which has proved to be of considerable value in presenting the doctors' story to the public. It has been widely distributed, along with literature directed against socialized medicine and has done much to inform the public of the doctors' place in local community activities.

The public has been educated to call the Kern County Medical Society office when in need of a doctor, this to such an extent that about 1,500 referrals were made during this last year, with an increase in calls during the last few months of the year.

The full-time medical society office has become strong, and its existence has become known as a service agency to almost all local organizations and to a great many people of Kern County. Financially, the medical society office has gained ground to a considerable extent, but as yet does not receive sufficient business to support the public relations program as well as the medical economics division.

Without reservation, it can be said that the Kern County Medical Society has come a long way in this year towards accomplishing its purpose of favorable public relations and the building of a reserve of favorable public opinion.

S. W. Iseminger, *Secretary*

San Luis Obispo County Medical Society

The San Luis Obispo County Medical Society held nine regular scientific meetings, two social meetings, and one postgraduate meeting during 1949. Meetings were well attended and the scientific discussions by out-of-town speakers were well received.

A public relations committee was organized. A blood bank committee has been very active and 1950 should show results of affiliation with a tri-county blood bank.

Nine applicants were elected to membership in the society.

John H. Woodbridge, *Secretary*

Santa Barbara County Medical Society

The Santa Barbara County Medical Society now has a total of 137 members. During the year 16 new members were elected; seven members transferred elsewhere; 14 new members will be elected during the next three months.

Our meetings are held at 8 p.m. on the second Monday of the month at Bissell Auditorium in the Cottage Hospital. We have been fortunate in having several prominent speakers during the year who have contributed greatly to the enjoyment of our members by the excellent presentation of their subjects. The list includes such distinguished men as Drs. Andrew Dowdy, John P. Jones, E. C. Rosenow, Paul Starr and Ralph E. Homann.

A movement to create a blood bank for the counties of San Luis Obispo, Ventura and Santa Barbara was launched at a meeting of members of the California Blood Bank Committee, directed by Dr. J. Upton, and a discussion by area representatives of the blood bank committees of the tri-counties together with newspaper representatives, which resulted in a resolution to the effect that the Santa Barbara County Medical Society would contribute $5,000 towards the founding of the Tri-Counties Blood Bank.

The Cancer Commission of C.M.A. through many qualified speakers presented a splendid program of the diagnosis and treatment of various forms of the disease. Dinner at the Montecito Country Club preceded the evening session and a large and appreciative audience was in attendance.

During the year 1949, a committee was formed to write the history of the county society. Research disclosed that the society is older than was supposed, the first meeting being in 1894. The work is going along very well in spite of the difficulty encountered in securing material on the early presidents and their photographs. When completed, the society feels that this will be a valuable addition to their annals.

The Santa Barbara County Medical Society now looks forward to a busy and interesting year under the guidance of our new president, H. I. Burtness, and President-Elect H. V. Findlay. Our other officers elected at the December meeting were: vice-presidents at large, G. H. Coshow and L. E. Heiges; secretary-treasurer, A. E. Wentz; delegates, J. G. Campbell (two years), A. E. Wentz (one year), A. B. Wilcox (one year); alternates, D. F. McDowell (two years), R. W. Lambuth, Max Hammel. Council: H. I. Burtness, G. H. Coshow, L. E. Heiges, H. E. Henderson and D. E. Reeves.

A. E. Wentz, *Secretary-Treasurer*

Ventura County Medical Society

The Ventura County Medical Society had 59 active, six associate and five retired members at the close of the year. There are 12 applications for membership on file.

Meetings are held on the second Tuesday of each month at the Colonial House in Oxnard. Meetings are preceded by a dinner, as we have found this greatly helps our attendance. Ten regular and one special meetings were held during the year. The special meeting was a symposium of cancer conducted by members of the California Cancer Commission.

There is now sufficient money in the building funds of the two private hospitals to start construction of new additions. The Foster Hospital of Ventura plans to add a 20-bed obstetrical wing. The St. John's Hospital in Oxnard plans to build a 75-bed addition. Plans are being drawn for a 75-bed addition to the County Hospital, but as yet the funds have not been appropriated.

There is still a shortage of nurses although this condition is improving.

The following officers were elected to serve for the year of 1950: President, W. C. Huff, Oxnard; vice-president, J. M. Hunter, Ventura; secretary, A. A. Morrison, Ventura; delegates, J. W. Moore and A. A. Morrison, Ventura.

A. A. Morrison, *Secretary*

FOURTH DISTRICT

Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare, and Tuolumne Counties.

Axcel E. Anderson, Fresno, *Councilor.*

Fresno County Medical Society

Under the leadership of President William L. Adams, Jr., and through the efforts of our various committees, the Fresno County Medical Society made many important strides forward in the field of public health and public relations during 1949. A very brief resume follows.

The society's headquarters office at 919-920 Helm Building, Fresno, was in full operation by January 3, 1949. It is serving as an increasingly active medical information center, not only for the public but for the profession.

A 24-hour emergency referral system was set up early in the year. In addition, an efficient system for making routine referrals was established.

Two 13-week series of radio health programs have been sponsored by the society through the cooperation of local radio stations.

The society has been effectively represented at many public health conferences with public and private agencies, city and county schools, health councils, and at citizens' meetings and professional conferences.

Members of our speakers' bureau have appeared before some 28 groups in Fresno, Madera, Kings and Tulare counties.

The society recommended a voluntary health insurance program for elementary school children in the Coalinga School District, and the cooperation of our society members in the care of certain city school children on a reduced fee basis. Seventy members are on this latter panel. Standing orders for city school nurses were reviewed and approved. Close liaison has been maintained with the county health department. Membership in the Fresno County Chamber of Commerce and the Fresno County Coordinating Council was approved.

Improved press relations were established with the local daily newspaper and the weeklies in the outlying towns.

The hospital committee surveyed the local rest homes and submitted a report to responsible agencies. The society endorsed the need for a valley children's hospital in Fresno.

Particular attention has been paid to various legislative measures in Sacramento and Washington and direct representation made to our legislators.

A postgraduate seminar and a cancer symposium were conducted in cooperation with the C.M.A.

Our constitution and by-laws were revised and await final adoption.

Delineation of blood bank responsibilities and sanctioning of the valley blood bank were effected.

The society adopted the group malpractice plan and the educational program of the American Mutual Liability Insurance Company.

Monthly publication of *The Bulletin* began in May and is sent regularly to society memberships of Fresno-Madera, Kings and Tulare counties.

Society membership has increased from 189 to 208 active members; 222 members of all classes. Scientific programs have been of a high quality and attendance at our monthly meetings has increased considerably.

Fred E. Cooley, *Secretary-Treasurer*

Kings County Medical Society

The Kings County Medical Society has enjoyed a progressive year highlighted by obtaining the cooperation of the local press in publishing in full our letter to the editor refuting many items of their editorial on compulsory medical insurance.

A. L. Barreiro, *Secretary-Treasurer*

Merced-Mariposa County Medical Society

The following report of the proceedings of the Merced-Mariposa County Medical Society for the year 1949 is respectfully submitted.

The following new officers were elected for the year 1950: James L. Dennis, Merced, president; Herbert O. Leff, Chowchilla, vice-president; Harry R. Maytum, Merced, secretary-treasurer.

During the past year the medical society terminated its contractual staff relationships with the Merced General Hospital and the Merced County Board of Supervisors.

Several members of the society joined the American Academy of General Practice and they all attended the meeting of the state chapter at Santa Barbara. At this meeting James L. Dennis, the president of our county society, was elected to the board of directors of the California Chapter of the American Academy of General Practice. His district comprises most of the southern portion of the San Joaquin Valley, including the counties of Kern, Kings, Tulare, Fresno, Madera, Mariposa and Merced.

During the past year a postgraduate course in cancer detection was held under the auspices of the California State Cancer Commission and the C.M.A. This meeting was attended well and was very favorably received. Several members also attended the postgraduate study meetings of the Stockton postgraduate study group during the fall months.

During the past year the following new members were elected to the society: Geraldine and E. D. Clements of Gustine, Earl H. Koepke of Merced, Shelby Hicks of Merced, Samuel Carson of Atwater.

A new constitution and by-laws are in the process of being formulated.

The regular meetings are held each third Thursday at the Hotel Tioga in Merced at 7 p.m., and any visiting M. D.'s are welcome to attend. It is expected that during the coming year several meetings will be held in the west side of the county.

HARRY R. MAYTUM, *Secretary-Treasurer*

San Joaquin County Medical Society

The year 1949 has been one of a great deal of activity for the society under the leadership of Dr. W. H. Langley Collis.

Early in the year many demands were made on the members to contribute some opposition to the program of socialized medicine that was being advocated both in the State of California and nationally. Our January meeting was devoted to a discussion of these problems by Ed Clancy, field secretary of the C.M.A., and by Mr. Ben Read, executive secretary of the Public Health League. Shortly thereafter a committee, consisting of 10 per cent of our membership and under the chairmanship of Dr. A. K. Merchant, was appointed to act on behalf of the society. This committee remained active until the danger of passage of unfavorable legislation in 1949 was past.

The local Red Cross blood bank has continued to function in a satisfactory manner and some seven thousand pints of blood were dispensed during the past year. Much of its success can be attributed to the continued supervision of Dr. Donald C. Harrington. The local program of the American Cancer Society has also progressed favorably due to the efforts of Dr. J. O. Eccelston, chairman of our cancer committee. Dr. C. A. Broaddus and Dr. Louis P. Armanino were co-chairmen of the committee of the postgraduate study club. A series of eight excellent lectures was given.

During the present year the question of the feasibility of engaging a full-time executive secretary for the San Joaquin County Medical Society has arisen. Early in the year Mr. Joseph F. Donovan of San Jose was kind enough to meet with the board of directors and outline in detail the program that has been developed by the Santa Clara County Medical Society. Dr. John T. McNally was named chairman of a committee to investigate this problem as related to our own county and he has done a great deal of work in order to assemble all relevant information. At our regular November meeting Mr. Rollen Waterson of Alameda County told our membership of the accomplishments of the executive secretary in his county. His address provided a great deal of discussion. A vote taken at this time indicated that a majority of the membership favored the executive secretary program but that there was sufficient opposition to the plan to make it seem wise to defer its adoption until the entire membership should become more familiar with the proposal.

The following scientific programs were presented during 1949:

Feb. 3, Head Injuries, by Dr. Howard A. Black.
March 3, Bronchiectasis, by Dr. Gerald L. Crenshaw.
April 7, The Lymphomas, by Dr. Warren Bostick.
May 5, Child Surgery, by Dr. Victor Richards.
June 9, Alkalosis in Peptic Ulcer, by Dr. George K. Wever.
Sept. 1, Blood Fractions and Their Clinical Use, by Dr. Paul G. Hattersley.
Oct. 6, Chronic Pancreatitis, Symposium.
Dec. 1, Coronary Disease, by Dr. W. Friedman.

There was a net gain in membership of seven, making a total of 141 members.

The panel for the San Joaquin County Medical Society for 1950 is as follows:

President, George K. Wever; first vice-president, James J. Heffernan; second vice-president, Earl Longley; secretary, Frank A. McGuire.

Directors: W. H. Langley Collis, Robert C. Winter, William Brock, Verne R. Ross, Edmund P. Halley, C. V. Thompson, and Emil Gough.

Delegates to C.M.A.: Frank Doughty, John O. Eccelston, and Neil P. Johnson. Alternates: Frank A. McGuire, Rudolph B. Toller, and Louis P. Armanino.

F. A. MCGUIRE, *Secretary*

Stanislaus County Medical Society

Regular business and scientific meetings were held during the year 1949. A special activity of the society for the past year was the institution of postgraduate refresher courses for the entire membership of the society. Two such courses were held during the year with the cooperation of the California Medical Association, The American Cancer Society and the California Tuberculosis and Health Association.

Membership in the society has increased during the year from 69 to 78 members in good standing at the close of 1949.

J. LYLE SPELMANN, *Secretary*

Tulare County Medical Society

Regular monthly meetings of the Tulare County Medical Society were held through 1949, under the leadership of Dr. Parkinson serving as president.

Death claimed Dr. Lewis Seligman, past president and active member in this society's activities.

Active membership during the year increased to 73 members with five additional applications pending at this time. A new plan of holding meetings in the various towns of the county was inaugurated this year with good attendance. Programs were arranged by the doctors in the towns sponsoring the meeting. The programs given this year were of a practical nature and suited to the needs of the doctors practicing in the rural areas.

The annual ladies' dinner dance was very successful in that everyone had a very enjoyable time in their gay costumes, square dancing and so forth at our '49er party.

The Nettleship Company of Los Angeles was engaged by over 50 per cent of our members to handle their malpractice insurance and most of the members further availed themselves of the company's low rate health and accident policy.

At year's end plans are under way for the formation of a visiting staff for the Tulare County Hospital and for the formation of a Tulare County branch in the American Cancer Society.

WILEY C. ZINK, *Secretary*

FIFTH DISTRICT

Monterey, San Benito, San Mateo, Santa Clara, and Santa Cruz Counties.

Hartzell H. Ray, San Mateo, *Councilor.*

San Mateo County Medical Society

At the close of 1949 this society included 177 active and 11 associate members on its roster with another ten awaiting action on their applications. At its December meeting the group elected Ralph D. Howe to replace Thomas E. Farthing as president for 1950. Along with Dr. Howe, Benjamin H. Page was elected vice-president, succeeding R. D. Borley; and Daniel W. Boudett succeeded Ian W. Luke as secretary-treasurer.

It is interesting to note that membership continued to grow at better than two doctors a month, although the population growth has apparently passed over its peak.

The society felt that due to its increasing size and the ever-present complexities, it would be a good move to hire an executive secretary; so on October 24 this was accomplished.

The Sequoia Hospital in Redwood City is fast nearing completion and will be ready for patients about October 1950. Plans are completed and construction is shortly to begin on the Peninsula District Hospital in Millbrae-Burlingame.

IAN W. LUKE, *Secretary*

Santa Cruz County Medical Society

Under the able leadership of Allen J. Pederson of Santa Cruz this society enjoyed a very successful year. Six regular meetings were held at bi-monthly intervals and, in addition, a cancer symposium was held during the spring. All meetings were dinner meetings. In January Leon Goldman from the department of surgery at the University of California presented a paper on "Modern Concepts of Thyroid Disease." At the time of the March meeting the members were the guests of the staff of the Santa Cruz County Hospital. Following dinner, Dr. Garnett Cheney of the Stanford Medical School presented a paper on the "Use of Anticoagulants." In May Dr. Lowell Rantz of Stanford Medical School was the speaker and presented a paper on "Atypical Rheumatic Fever." The wives of the members were invited to the July meeting, at which time the subject of "Behavior Problems in Children" was presented by Dr. Hale Shirley of Stanford Medical School. Dr. Henry Brainerd of the University of California Medical School was with us in September and spoke on "Antibiotics and Their Clinical Application." At the November meeting, which was also the annual business meeting, Dr. Leon Goldman was again our speaker. His subject was "Gallbladder Disease."

Samuel B. Randall, *Secretary*

SIXTH DISTRICT

San Francisco County.

M. Laurence Montgomery, San Francisco, *Councilor.*

San Francisco County Medical Society

This society had a very active and productive year in 1949, and its accomplishments were many and varied.

Upon receipt of the "Simplified Blueprint of the Campaign Against Compulsory Health Insurance" from the National Education Campaign Committee headquarters of the A.M.A., the society acted immediately on the four points outlined therein for its part in the fight. A speakers' bureau was organized immediately, and a firm of public speaking experts was engaged to give a series of lectures to our members. Following that, the basic tips contained in the lectures were published in *The Bulletin* for the information of the members unable to attend.

A strong resolution against compulsory health insurance was adopted by the society, and copies were sent to President Truman and all of our legislative representatives, both state and national. It was not necessary for this society to set up a press committee as we have had in operation for several years a well working press news bureau. However, numerous meetings were held with the press in a special effort to give unbiased facts to counteract the propaganda barrage laid down by the compulsory health plan proponents.

In collaboration with the state organization, a system of pamphlet distribution to member doctors was worked out. Also our splendid Woman's Auxiliary undertook the major task of visiting each doctor's office to check on his supply of literature, to ascertain whether he had received and was displaying his Fildes poster, and to furnish any factual or additional information required by the doctor and/or his office assistants. The Auxiliary did an outstanding job in covering this project, and along with it managed to contact most medical building owners and managers in San Francisco to the end that the Fildes poster is hanging in their elevators.

Our Irwin Memorial Blood Bank continued to grow in amazing proportions, and in 1949 reached an all-time high in the collection and distribution of blood. It has grown so rapidly, in fact, that the society has had to give the bank additional space in the headquarters building for increased laboratory facilities. One important technical advancement made this year was the irradiation of plasma.

Our Bureau of Medical Economics has grown in stature and membership. The majority of our active membership now belongs to the bureau, and it is hoped that 1950 will see it have the most successful year in its history. The society has spent a lot of time and effort building up the bureau because it firmly believes that it is one of the chief public relations assets the medical profession has in our community.

The tuberculosis minifilm unit at society headquarters continued to serve its member physicians and their patients. The unit, which began operation on September 1, 1948, gave free minifilm chest surveys in its first year of operation to over 10,000 separate patients referred by member-physicians. Statistics on the number of active cases of pulmonary disease which were unsuspected prior to the survey are available at society headquarters for anyone interested.

The professional conduct committee investigated 32 complaints against our members this year; all but 11 of these concerned disputed fees. In some of the instances the committee felt that the fee was grossly excessive and unjust; in other instances, the committee felt that the fee was appropriate, and that the issue between doctor and patient arose because of the doctor's negligence in discussing with the patient *in advance of treatment* approximately what the fee might be, or upon what basis the ultimate fee would be computed.

The hearing center committee, which was established for the purpose of advising the San Francisco Hearing Society on matters of policy in the operation of its hearing center, had a very active year. Nineteen forty-nine saw the first full year of operation of the center. Several meetings of the committee were held to discuss fee schedule, personnel, relations with hearing aid dealers, and particularly the future course of the center. In its first year of operation it served about 500 clients with impaired hearing who were referred by 71 different private physicians, the San Francisco Department of Public Health, the Bureau of Vocational Rehabilitation, the State Department of Health (C.C.S.), Stanford and U. C. clinics and other Bay Region medical agencies. The need for the services offered by the center is indicated by the fact that there has regularly been a six-week to two-month wait for an appointment. Our committee has advised the Hearing Society that the center must expand in order to serve a larger number of the hard-of-hearing public efficiently. Present quarters do not permit of such expansion. The committee recommended that the physical equipment and good will of the Hearing Center be transferred to Stanford University, which has accepted provided the space for the expanded program and means of financing it can be arranged. It is hoped that 1950 will see the transfer effected.

The medical service committee had much work to do in 1949. One of its sub-committees worked out details of a plan for improving the society's referral service, particularly with reference to emergency.

The relationship of the society with all medical and diagnostic activities conducted by lay charitable organizations was considered. A set of standards was set up by which the merits of such organizations could be evaluated when society approval is sought.

This committee also was assigned to the task of considering the proposed U. S. Public Health Service mass tuberculosis minifilm survey. The committee recommended that a committee of tuberculosis specialists from the membership of the society be appointed to work with representatives of the San Francisco Department of Public Health, the San Francisco Tuberculosis Association, and the Public Health Committee of the San Francisco Chamber of Commerce and any other organizations interested in reducing the incidence of tuberculosis. This committee would determine whether or or not a mass tuberculosis survey in San Francisco would be desirable in view of this city's unique position as regards existing minifilm x-ray facilities.

The society's cancer commission continued to be active in the cancer control program in this county largely through its association with the San Francisco branch of the American Cancer Society.

The health education committee gave another health education seminar for school teachers during the spring seminar in conjunction with the health education committee of the San Francisco District Dental Society and the San Francisco Unified School District.

During the year, this committee has also been active individually and collectively in various political campaigns and in attendance at various Community Chest functions affecting the health education of the community.

The health education committee represented the society in the venereal disease case-finding project, which was a joint effort of the United States Public Health Service, the state and San Francisco County health departments, and to which the society has been invited. As a result of the efforts of this committee, most of the advertising techniques and material used were cleared through the society's publicity committee. Through the efforts of the health education committee, the State Health Department plan for supplying free medicines to private physicians for the treatment of their free and part-pay patients was salvaged temporarily. Also, as a result of the insistence of this committee, the State Health Department is now in process of simplifying the reporting of communicable diseases, and are proposing to use the same form for all communicable diseases, including venereal diseases, and eliminating many of the special forms which now clutter the desks of practicing physicians.

The program committee arranged for regular meetings of the scientific sections in medicine, surgery, eye, ear, nose and throat, and urology, under the direction of the section chairmen. At each of these, excellent programs of special interest to the members of each section were presented. In addition, a scientific session believed to be of interest to all members of the society was conducted at each general meeting. These were usually symposia in which speakers discussed a single subject in detail. Attendance at the various sections, and the general meetings has only been fair in spite of the fact that many of the programs have been outstanding scientific events. This is believed to be the result of the large number of hospital meetings with required attendance, and it is felt that it would be most desirable if the center of medical scientific interest could again be the county society.

The admissions committee reviewed over 180 applications during the past year. Monthly orientation lectures were given either by members of the committee or by the executive secretary.

In order to facilitate early admission to the society, these lectures were also given during the summer months when society activities are usually suspended. To judge from the last few years' experience, the orientation lectures are very definitely fulfilling an important function in acquainting prospective members of the society with various aspects of medical practice.

The C.P.S. review committee held several meetings during the year. Seven cases of misunderstanding between physician and patient were reviewed and acted upon. Cooperation from patient and physician in each case was excellent.

Policy problems of the C.P.S. board of trustees were discussed and opinion consensus transmitted to the trustees.

Fees paid to physicians by C.P.S. were recurrently discussed. It is the opinion of the committee that:

1. Present fee payments are too low and constitute primary cause for physician dissatisfaction.
2. Major cause of patient dissatisfaction was inadequate understanding of his coverage.
3. A certain danger exists in the tendency of organized groups of physicians endeavoring to raise fees paid their particular specialty.

The committee on industrial health did not meet formally during 1949 but handled many matters by telephone and correspondence such as assistance to the division of labor statistics of the State Department of Industrial Relations on a much-needed revision of the doctor's report form for occupational injuries, advice to a local company on the organization of an industrial medical program, advice to a large manufacturing company on the selection of a medical director for the West Coast, and the answering of queries from laymen concerning occupational poisonings.

The history and obituaries committee prepared obituaries for 16 of our members who died in 1949.

The publicity committee continued to explore mutual problems affecting newspapers and the profession. At a cocktail-dinner party given by this committee on behalf of the society, even further cooperation between the newspapers and the profession was achieved. The meeting was attended by various editors and representatives of all the newspapers, press services and hospital representatives. The Hospital Conference furnished a list of executives on whom the newspapers could call for specific information. It is safe to say that the efforts of the society in cooperation with the public relations committee of the San Francisco Hospital Conference have resulted in a marked improvement in the relations between physicians and the newspapers of our city.

We are happy to say that our society has functioned well and smoothly, and that its continued growth and progress are due to the hard work of its many committees, many of whom are not reported on herewith.

We hope to continue our march forward during 1950, and will lend every resource to the national and state struggle against efforts to socialize or communize our profession. It is our goal to continue to be of service to humanity, our community, and our nation, when called upon.

M. Laurence Montgomery, *Secretary*

SEVENTH DISTRICT

Alameda and Contra Costa Counties.
Donald D. Lum, *Councilor.*

Contra Costa County Medical Society

The present roster of this society indicates 121 active members, one associate member, and six retired members, as compared with a total of 101 members for last year. The officers for 1950 are: Melvin C. Bolender, who succeeds George Husser as president; Bernard B. Gadwood, who succeeds Melvin C. Bolender as vice-president; and R. R. Pinger, who succeeds Bernard B. Gadwood as secretary.

The bonds have been passed and plans are rapidly materializing towards the beginning of the new district hospital.

B. B. Gadwood, *Secretary*

Alameda County Medical Association

The Alameda County Medical Association's long-range public relations venture, inaugurated and reported in 1945, is achieving its projected ends. Every objective included in the initial blueprint has been accomplished.

We expected to earn a growing local appreciation of our sincere and extensive public service efforts, but we have been surprised and gratified to find outside confirmation of the public relations validity of Alameda County Medical Association work. This has been expressed by feature articles enthusiastically describing the Alameda County Medical Association program in public-opinion-conscious magazines with such divergent national audiences as *Woman's Home Companion* and the U. S. Chamber of Commerce *Nation's Business.*

As in all endeavors in the field of human relations, forward progress in our public relations program has brought us not just to visible goals, but to new points of vantage from which new opportunities can be seen—opportunities hidden by our former horizons.

That is the position of the Alameda County Medical Association today. A little has been accomplished. But a great deal is being learned of the needs and opportunities for further study and for further protection and promotion of the patient's interests as a sound basis for continually improving medical public relations.

We hope to report on this new work before the 1951 meeting of the House of Delegates.

Lester B. Lawrence, *Secretary-Treasurer*

EIGHTH DISTRICT

Alpine, Amador, Butte, Colusa, Eldorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Sutter, Tehama, Yolo, and Yuba Counties.
Wayne E. Pollock, Sacramento, *Councilor.*

Butte-Glenn County Medical Society

The Butte-Glenn Medical Society has made a rapid growth in the past year and the attendance at our meetings was excellent.

Our president, Dr. Louis P. Olker, has been most active in directing and meeting the responsibilities of his office, and the appointed committees have all met their obligations and have done the work assigned to them.

During the past year a new constitution and by-laws have been adopted, printed and distributed to every member. All proposed new members are placed on probation for six months and a committee during that time instructs them in the ethics of our profession.

We usually have a dinner meeting attended by the woman's auxiliary, which has a 100 per cent membership. Following the dinner the ladies have their separate meetings. During the past two years they have sponsored scholarships for two girls each year who are interested in the nursing profession. These girls are selected on the basis of scholarship, acceptance by some recognized hospital, and recommendations of teachers and other qualified persons as to character, activities and personality.

J. A. Chiapella, *Secretary*

Lassen-Plumas-Modoc County Medical Society

The Lassen-Plumas-Modoc County Medical Society has held a number of meetings during the past year. We were quite successful in obtaining excellent speakers in each instance and the professional programs were of exceptional merit and ideally suited to our needs.

At a meeting held in Susanville on April 23 officers for the ensuing year were duly elected as follows: President, J. Paul McKenney, Alturas; secretary, William J. Quinn, Alturas. Harold G. Trimble of Oakland gave a most excellent treatise on the common chest complaints we all meet and treat in general practice.

On September 10 a conference on neoplastic disease was arranged in Susanville by the C.M.A. in cooperation with the California division of the American Cancer Society. This was a very worthwhile meeting and it is hoped will be continued as a yearly event.

On December 3 a meeting was held in Alturas with Hugh B. Currin, M.D., of Klamath Falls, Oregon, presenting a most interesting and beneficial discussion on genitourinary problems as they affect the general practitioner.

William J. Quinn, *Secretary*

Placer-Nevada-Sierra County Medical Society

There was a total of nine meetings during the year:

1. Annual meeting held at DeWitt Hospital, Auburn, November 10, 1948: This was a dinner meeting and there were present 18 members and four visitors, including the guest speaker, James H. Yant, M.D., of Sacramento, who gave a very interesting address on Anorectal Diseases. This being the annual meeting, the following officers were elected for the ensuing year: President, C. Conrad Briner, Auburn; vice-president, Carl Angella, Roseville; secretary-treasurer, Vernon W. Padgett, Grass Valley; delegate, William M. Miller, Auburn; alternate, Harry N. March, Grass Valley. The following were also elected to the board of directors: President, C. Conrad Briner; vice-president, Carl Angella; secretary, Vernon W. Padgett; members, Louis E. Jones, Roseville, G. D. Tipton, Auburn, D. M. Kindopp, Auburn, and Walton Prescott, Grass Valley.

2. Meeting of December 8, 1948: This was a social dinner meeting, held at the Indian Mountain resort near Grass Valley, honoring retired member J. Gordon Mackay of Auburn. There were present 22 members and 11 visitors. As this was a social meeting, no scientific program was presented but a very pleasant evening was spent in reviewing past activities of the society and its members. At the close of the evening, Dr. Mackay was presented with a gold-headed cane.

3. Meeting of January 12, 1949, at DeWitt Hospital, Auburn: 18 members and eight visitors, in addition to the guest speaker, Dr. Dudley V. Saeltzer of Sacramento. Dr. Saeltzer's subject was "Pre- and Postoperative Bowel Obstructions," which was well received and which prompted many questions from the floor.

4. Meeting of February 9, 1949, at DeWitt Hospital, Auburn: There were present 17 members and the guest speaker, Dr. Lucas W. Empey of Sacramento, formerly a member of the Placer-Nevada-Sierra County Medical Society during his years of practice in Roseville. Dr. Empey spoke on "The Art of Medicine as Applied to Pediatrics," and he gave a very interesting and much enjoyed address.

5. Meeting of March 9, 1949, at DeWitt Hospital, Auburn, with 18 members present. The guests were Dr. Wayne Pollock of Sacramento, Councilor for the Eighth District of the California Medical Association; Dr. L. D. Howard of San Francisco, the guest speaker, and Dr. Rarick of the DeWitt Hospital staff. Dr. Pollock addressed the members briefly regarding the Industrial Fee Schedule as adopted by the C.M.A. which went into effect February 1, 1949. Dr. Howard then spoke on "Hand Injuries" and gave demonstrations of various splints, sutures, dressing, etc., after which he answered many questions from the floor.

6. Meeting of April 13, 1949: This meeting was also held at DeWitt Hospital, Auburn, with President Briner presiding. In addition to President Briner there were present 16 members and four visitors, including Dr. John Fanning of Sacramento, the guest speaker. Dr. Fanning spoke on "Dermatology and the Newer Trends and Drugs in Dermatology." His discussion of the subject was much enjoyed by those present.

7. Meeting of May 18, 1949, at DeWitt Hospital, Auburn, with President Briner presiding. There were present 17 members and four visitors. The speaker of the evening was Dr. Norman E. Freeman of San Francisco, who spoke on "Vascular Surgery." Dr. Freeman began his talk with an outline of the work that he did at DeWitt Hospital in 1945 and stated that during the war years DeWitt was one of the three vascular centers in the United States for the Army. Dr. Freeman's talk was very interesting and much appreciated by the members.

8. Meeting of June 8, 1949, at DeWitt Hospital, Auburn, with 14 members and three visitors present. A. E. Hirschler of Roseville, program chairman, introduced Mr. A. J. Affleck of Sacramento, member and past president of the California State Board of Pharmacy, who spoke on "Dangerous Drugs" and the laws under which physicians and pharmacists must operate. Mr. Affleck's talk was informative and well received by the members. This was the last meeting before the summer recess.

9. The fall session was resumed with a meeting held at DeWitt Hospital, Auburn, on October 12, 1949. Dr. H. C. Sanderson of Sacramento was to have been the guest speaker but, due to an emergency, he was unable to attend and a program was presented by the members of the society.

Vernon W. Padgett, *Secretary*

Sacramento Society for Medical Improvement

Organized in 1868, the Sacramento Society for Medical Improvement has enjoyed steady growth. The society now has over 200 members, many of whom are active in local and state medical affairs. Meetings are held monthly, at which time speakers, usually from the medical schools in San Francisco, aid in keeping us informed of recent developments. An annual banquet is held March 17, and the December meeting is devoted to election of officers. A history of the society is now in preparation.

Edmund E. Simpson, *Secretary*

Shasta-Trinity County Medical Society

The Shasta-Trinity Medical Society has 26 members, having gained three new members in the past year.

At a recent meeting H. T. Hinman was reinstated as president, J. L. Price as vice-president, and R. W. Thomas as secretary-treasurer.

Regular meetings of the society are held on the first Monday of each month.

R. W. Thomas, *Secretary-Treasurer*

Yolo County Medical Society

The Yolo County Medical Society held regular monthly meetings during the year except in July and August. Excellent speakers were obtained who discussed recent advances in various phases of medical practice. Two meetings were devoted partially to various aspects of the National Education Campaign.

Under the direction and with financial backing of the Yolo County Medical Society, two blood bank depots were established in Woodland and operated in conjunction with the Sacramento Community Blood Bank.

In December, the Yolo County Medical Society met with the Sacramento Society for Medical Improvement at a joint meeting sponsored by the Cancer Committee of the C.M.A.

New members admitted during the year include Richard Cundiff, Marvin C. Davis, J. F. Flynn, H. L. Fuller, William H. Johnston, Roy A. Neumann, and Frederick A. Schroeder.

Charles L. McKinney, *Secretary*

Yuba-Sutter-Colusa County Medical Society

Nine regular meetings were held during the year. It has been the custom of this society not to hold regular meetings during the summer vacation months, June, July, and August; however, during the last year, due to the critical situation locally and on the national level, numerous special meetings were held during the summer and between regular meetings throughout the year.

Past President Anthony M. Fratis has achieved notoriety for having called more meetings than any other president in the history of the medical society. Dr. Fratis, a former Army colonel, worked with diligence and untiring effort in the interest of the society and organized medicine as a whole and on numerous occasions in preference to his private work. Because of ability and enthusiasm he fired his committeemen with willingness to work and cooperation and many important things have been accomplished. To mention a few:

1. A well organized blood bank has been founded and a blood depository and refrigeration unit is established in one of our local hospitals and is functioning in quite a satisfactory manner.

2. Complete hospital staffs have been organized for the two private hospitals, and meetings are held the last Tuesday of each month. The chairman of the combined hospital staffs is J. W. Linstrum, who for several years was an alternate to C.M.A. The secretary is Romayne B. Whitney. Hospital staff privileges are extended to all local Doctors of Medicine who are eligible for membership in the county medical society, upon recommendation to the hospital management by the chairman of the staff.

3. Yuba County Hospital—For many years all the medical and surgical services at the county hospital have been under the direct responsibility of the county medical society in regard to therapy. The set-up is briefly as follows: By agreement with the county board of supervisors, the medical society selects and recommends a resident physician for each year. (Most residents stay only about 12 months on the average.) The resident is on a straight salary paid by the county, and is not allowed to do private practice or to accept insurance cases. Now regarding his professional duties: He is under the direct supervision of

the medical society divided into members of attending staff (senior and junior) and the consulting staff. Without going into detail, this gives the members of the society a supervisory and teaching function whereby the resident can be greatly benefited, but primarily the members of the Yuba-Sutter-Colusa County Medical Society are rendering and contributing to a high standard in the practice of indigent medicine for the local community, creating a degree of goodwill and favorable comments as well as a considerable saving to the taxpayers, which we hope is creating a more favorable feeling toward organized medicine on the local level.

4. Sutter County Hospital—Using the above paragraph as an explanation, I am now happy to report that, due to the perseverance and untiring efforts of B. F. Miller, chairman of the hospital relations committee, we now have a resident physician of our choosing, and that the whole hospital set-up is functioning on the same basis and policies that we instituted previously at the Yuba County Hospital. A fairly adequate social service is in operation at both Yuba and Sutter county hospitals. Therefore the medical and surgical care of the indigent in these two counties is being handled quite to the satisfaction of the medical profession and the community concerned.

5. Colusa County Hospital—For several months past the situation at the Colusa County Hospital has been under consideration by the county medical society. The majority of the membership would like to see this organization brought into line and operating on the same basis as the two previously discussed hospitals. A committee has worked for several months with the hospital medical director, Dr. Joseph E. Tollottson, with the Colusa board of supervisors and with various lay organizations in Colusa County. Special investigations have been held and definite recommendations have been made. Representatives of C.M.A. have made investigations and met on numerous occasions with the committee to help iron out the difficulties. To date very little if any satisfactory changes in the operation of the hospital have been instituted. Only time will tell how much if anything has actually been accomplished. However, in view of acquiescence of Yuba and Sutter counties to our policies and the satisfactory manner in which these two hospitals are functioning, the members are still hoping, and a revision of the set-up at the Colusa County Hospital is still on the agenda of the Yuba-Sutter-Colusa County Medical Society.

6. General practice is the only sub-section of the medical society; Joseph J. Salopek is the chairman and Stanley R. Parkinson is the secretary.

Meetings of the General Practitioners' Section of the Yuba-Sutter-Colusa Medical Society were well attended during the past year. The meetings were stimulating and many good points were brought up for discussion at the regular medical meetings.

During the early sessions of the year the atendance was rather small and the meetings were held in the various doctors' offices or homes. However, as the year progressed the attendance became so great that it was necessary to hold the meetings in the Hotel Marysville. Meetings were as follows:

January: Discussion led by Dr. Walter Schmidt on "Mass Testing for Diabetes."

February: An excellent discussion led by Dr. J. W. Linstrum on "Ambulatory Proctology."

March: Well attended. There was no clinical session, but discussion relative to the desirability of association with the California Academy of General Practice; a discussion of hospital relations, indemnity insurance, and organization of the Yuba City Community Hospital.

April, May: Minutes not available.

June: Discussion led by Dr. R. L. Hamilton on "Thyroidism" and the use of the new drugs relative to the treatment.

July: Discussion led by Doctors Selby and Loomis on "Psoriasis." Also session on business and policy.

August: Minutes not available.

September: Discussions led by Doctors R. L. Hamilton and Joseph Salopek on "The Use of Parenteral Fluids." Also further discussion on business and policy.

October: Discussion on business and policy. A resolution was drawn up at this time for presentation to the Society regarding a course on "Orientation and Ethics" to new members of the medical society.

November: After considerable business there was a discussion on "Public Health" by Doctors Miller, R. L. Hamilton, Swift, Loomis, Fratis and Franklin.

December: Large turnout. Frederick Kriete, M.D., chief of maternal health and crippled children's program, was invited for a discussion. This meeting was rather lively and many of the inequities of the program were pointed out, but remained unsolved.

It is anticipated that the 1950 year will be again a year of considerable policy and business meetings, as this group is the only group whose problems are numerous.

It is also hoped that the affiliation will be completed with the California and national sections in General Practice.

7. Woman's Auxiliary: Every year for the past several years an attempt has been made to sponsor a Woman's Auxiliary to the local society which would affiliate with the State Auxiliary. Only late in 1949 was approval granted by the medical society; now it's up to the women. The officers of the State Auxiliary have been so notified and have been asked to help in the organization of local Woman's Auxiliary.

8. Yuba City Community Hospital: A private hospital had been closed because of unsatisfactory management; its purchase and reopening were worked out by a committee of the medical society with business leaders of the local community, and the purchase was subsidized by members of the medical society, to prevent it from being purchased by osteopathic interests. A cooperation was organized and stock sold to complete the purchase. A satisfactory manager was secured and this hospital is now functioning properly and has an organized medical staff.

9. Among the programs during 1949 were: (1) A representative of the Abbott Company presented a motion picture on intravenous infusions and intravenous anesthesia. (2) A sound motion picture on "Human Growth and Sex Education" was previewed by the society and approved for showing to students at Yuba County schools. (3) Two postgraduate sessions were held in Marysville, the first in cooperation with the Cancer Commission in June, and the second in December. (4) Dr. Wayne Pollock, Councilor, Eighth District, was at the October meeting and spoke on medical ethics and recommended an indoctrination course for all prospective members. (5) Dr. Garnett Cheney, professor of medicine, Stanford University, spoke to us on the subject of gastroenterology and the present status of cabbage-juice therapy. (6) Dr. Ernest W. Page, Berkeley, and Lyman M. Stowe were guest speakers at the December meeting.

10. Membership: New members acepted in 1949—two; new members by transfer in 1949—one; associate members in 1949—one; number of members on leave doing graduate study—two.

A bulletin board was erected in one of the hospitals; the secretary has been quite busy posting on the board volumes of literature received from C.M.A., A.M.A., and allied medical organizations. An attempt has been made by the secretary to keep the bulletin board relatively up to date as far as possible. The bulletin board was instituted for the privilege and benefit of the members concerned, and primarily for the reason of lack of time at medical meetings. Having instituted this new medium, we have considerably more time for important issues and our meetings are not so encumbered.

A roster of physicians has been set up in both Yuba and Sutter counties for emergency calls, so that physicians are on call at all times.

During the year the secretary attended the Secretaries' Conference in San Francisco and the Rural Health Program in Sacramento, making available full and complete reports to the local society.

All literature supplied to this society on anti-government-control medicine was distributed as directed; this was in turn passed on to physicians' individual friends and patients.

Full and complete cooperation has ben given to California Physicians' Service.

The president for 1950 is Stanley R. Parkinson of Marysville. The vice-president is Benjamin F. Miller of Yuba City; the secretary-treasurer is Leon M. Swift of Marysville; the delegate is Stanley R. Parkinson (1951); the alternate is Walter J. Schmidt (1951) of Marysville.

The date of meeting has been changed to the second Tuesday of the month instead of the second Wednesday.

Leon M. Swift, *Secretary*

NINTH DISTRICT

Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Siskiyou, Solano, Sonoma, and Trinity Counties.

John W. Green, Vallejo, *Councilor.*

Marin County Medical Society

The Marin County Medical Society has had a very satisfactory and worthwhile state of being through the year of 1949.

The membership has remained the same with considerable change in membership, four of the recent members having transferred out of the society, their places being taken by four new applicants. Several prospective new members will be accepted in the early months of 1949.

Nine monthly meetings have been held during the year. All meetings were well attended; a lively interest has prevailed throughout the year. The obstetrical cases continue to keep most of the hospital beds full.

A bond issue was passed last June to build a 100-bed district hospital. The board of directors have the plans drawn and hope to have all the details approved by July 1, 1950, in order to get the promised government money. The site has been purchased and plans submitted to the state department for its study and approval.

All medical specialties are now well represented and they appear to be doing a very satisfactory job in the county.

CARL W. CLARK, *Secretary*

Mendocino-Lake Counties Medical Society

The January meeting of the Mendocino-Lake Counties Medical Society was held at Willits, California. The officers for 1950 were elected as follows: E. C. Bennett of Ukiah was reelected president. Robert B. Smalley of Willits was reelected secretary-treasurer. E. C. Bennett was elected delegate and Clemens M. Biel alternate.

Plans for 1950 were discussed. Considerable time was given to discussion of political problems, particularly socialized medicine. The meeting was particularly characterized by the unanimity of thought of the members.

ROBERT B. SMALLEY, *Secretary-Treasurer*

Napa County Medical Society

The year 1949 came to an end with the Napa County Medical Society in good condition. There was some decrease in membership due to the rather sharp increase in assessments. Inasmuch as many of our members are engaged in institutional practice, and in no way engaged in private work, some felt unable to meet these rates and several men who had kept regular membership in the past preferred to become associate members, thus saving something on the expense of their connections with the society.

M. M. Booth of St. Helena served as a very satisfactory president and our meetings throughout the year were moderately well attended. During the year it was the aim of the society to instruct our local people in regard to the disadvantages of state medicine which so seriously threatens us at this time. The society put on one large party at the Napa Valley Country Club to which were invited over 100 of the most prominent business and professional men of the community, and the officers of the State Medical Association. At this meeting several talks were given showing the undesirability of socialized medicine and state control of matters which should be left to the individual.

Our November meeting was held at the Veterans Home where the board of directors has given us a permanent invitation to accept their hospitality in November. This meeting was very well attended and a delicious dinner was enjoyed by all. It being our annual meeting, John G. McGrath of Imola was elected president for the ensuing year; Charles W. Brown of St. Helena was named vice-president, and the secretary was reelected. D. H. Murray is our delegate and Harry V. Baker alternate. We anticipate satisfactory results for the year 1950.

ROBERT STARR NORTHROP, *Secretary*

Siskiyou County Medical Society

The Siskiyou County Medical Society has, during 1949, been occupied in furthering development of a county-wide hospital district. Distances and geography present real obstacles to adequate hospitalization for all of the population in the single county institution located at Yreka. It is felt that additional units should be built in the Tulelake, Mt. Shasta and Scott Valley areas and that the entire county hospital system should be under the direction of a county hospital district board.

During October at a dinner meeting in Yreka, the members very much enjoyed a conference on neoplastic disease, offered by the State Cancer Commission. Physicians from the Oregon State Medical Society practicing in adjacent areas also attended.

WERNER FLETCHER HOYT, *Secretary*

Solano County Medical Society

The Solano County Medical Society has just completed a year of interesting and instructive activity under the guidance of President Arvill Chappell. Authorities in a wide variety of medical fields were heard during the year. Among them were Paul Michaels, M.D., pathologist, whose subject was "Tumors of the Breast"; Gerald Gill, M.D., "Orthopedics in General Practice"; A. E. Bennett, M.D., "Common Errors in Diagnosis and Treatment of Psychosomatic Disorders"; Stanley Truman, M.D., president of the American Academy of General Practice, "Aims and Progress of the Academy"; Albert Rowe, Sr., M.D., "Allergy"; E. F. Egleston, M.D., "Arthritis," accompanied by an interesting film on the use of ACTH.

Two important and long-needed pieces of work were accomplished during the year. A committee under the guidance of L. S. McClean drew up a new constitution and set of by-laws. These were accepted at the August meeting. Carlton Purviance and committee revised the fee schedule to meet present-day economic conditions.

Membership changes included the retirement of Ream S. Leachman, the transfer of Charles Holly to Los Angeles County, and the acceptance of the following new members: Erwin Shankman, Lionel Johnson, Selmes Funkhauser, and John Raskin.

Members of the society participated in the four-county get-together (Sonoma, Solano, Marin, and Napa) held this year at the Country Club in Santa Rosa, and in the C.M.A.'s Cancer Commission meeting at the Fairfield-Suisun Air Base.

Through the year the officers and members have kept abreast of developments on the medical-political front and have extended themselves to see that advantage was taken of all opportunities to convince legislators, and the public as well, that free enterprise in medicine must continue.

Annual election of officers held in November resulted in the selection of B. V. O'Donnell, 327 Georgia Street, Vallejo, president; Matthew Gibbons, 405 Georgia Street, Vallejo, vice-president; and Carl Reichman, 344 Virginia Street, Vallejo, secretary-treasurer.

There was plenty of holiday cheer at the last meeting of the year—the annual Christmas party. With genial John Green as M.C., each member was given an opportunity to tell his favorite story.

HARRY G. LAMMEL, *Retiring Secretary*

Sonoma County Medical Society

The Sonoma County Medical Society ended the year of 1949 with a total membership of 93. Sixteen new members were accepted during the year and eight members were transferred. Eleven meetings were held during the year with an average attendance of 55 members. One of these meetings was a joint meeting with the Sonoma County attorneys, dentists and pharmacists. The meeting held in August was a four-county meeting with physicians attending from Marin, Napa, Solano and Sonoma counties. Dr. Stanley Kneeshaw was main speaker at this meeting.

Seminars held during the year included a clinical conference sponsored by the C.M.A. and held in March at the Sonoma County Hospital under the directorship of Carroll Andrews, chairman of the Postgraduate Committee.

A postgraduate course sponsored by the American Cancer Society and the C.M.A. was held in Santa Rosa in April and was attended by doctors from Sonoma County and surrounding counties. John M. Kenney, member of the board of the California division of the American Cancer Society and chairman of the local Cancer Society, coordinated this program.

This year the Sonoma County Community Blood Bank commenced operation. This project was community sponsored by public donations and also underwritten by members of the Sonoma County Medical Society to the extent of $100 per member without interest. At present the required attendance of a doctor is being met on a voluntary basis by society members and Owen F. Thomas is technical director. The blood bank is now supplying blood to Sonoma County and surrounding areas and has every assurance of being a success.

WILLIAM J. RUDEE, *Secretary-Treasurer*

California
MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION
© 1950, by the California Medical Association

Vol. 72 MAY 1950 No. 5

Case History of Uncle Sam

R. Stanley Kneeshaw, M.D., *San Jose*

UNCLE SAM, symbol of the United States, was born in the eastern part of North America in 1776. His parents were a liberty-loving people who wanted to be independent. He was not named until 1812 when he had his first quarrel, and it was with an old chap named John Bull. He emerged victor and set up quite a reputation for himself, as he was the first to stand up against this fellow John Bull, and he gained the respect of others quickly. He grew and grew but finally he had an internal illness in 1861. Although he took a long time to recover, he emerged from this illness quite a strong fellow.

At this period in the life of Uncle Sam, man was rewarded for his individual efforts. The ability of a person to do anything and the ultimate achievement of it, was not dependent upon his coming from any given stratum of society, but was dependent upon his own individual efforts and upon interesting others to help him attain his goal. Nor was it necessary for such an individual to come from this country of ours. Foreign people who had the burning urge to be free and to create were given equal opportunity to work out their plans provided they did not interfere with the rights and liberties of others.

In 1918 and again in 1941, Uncle Sam was engaged with other nations in suppressing an aggressor who threatened to take away from him that freedom that we in America are so proud of. These two wars showed the world that Uncle Sam still was a power to be treated with respect. These wars also showed other nations that the so-called capitalistic Uncle Sam was able to get things done; that he was not a softy; that he still had red blood flowing in his veins and that he still could be aroused to fight. Here he was, the only one of all these outstanding figures of the world who had maintained all of his faculties, had lost no appendage. John Bull had lost many of his digits, or partially lost them. John Bull had become weakened by an infection; a virus, I believe, called Socialism and Communism. Little by little, this virus had weakened him until, were it not now for the transfusion of American dollars, one wonders if he would be able to survive.

Now a similar infection seems to have befallen Uncle Sam. It seems that although for many years he has had to digest some of the products of the Socialists and the Communists, not until recently has he been very greatly affected. It has been noticed of late that the respect in which he had been formerly held by foreign countries has waned. Now citizens of the United States are held in ridicule in some countries abroad, are arrested, are murdered and nothing is done about it, for little do the foreign countries where such things happen seem to fear the great ideal, who for 174 years has taught them to respect his power and his ability. And he stands idly by and does nothing about it.

What has come about that has made this great change of feeling? Are the other nations so strong that they no longer fear and respect Uncle Sam, or has Uncle Sam become a doddering old man who has to submit to such humiliations? It is not the former, because these other nations are not stronger. Then it must be that Uncle Sam is getting softer. What ailment then has so affected him? What is it that has infiltrated his system to make him so susceptible to new, untried schemes? Here is where consultation on the part of the doctors is necessary, so consultation we will have.

We must go carefully into the background that has made Uncle Sam what he once was. We must go into the causes of this great debilitating disease that has so affected other similar characters and has rendered them so impotent that they are useless and dependent on their parent, the Government.

Address of the President, California Medical Association, at the 79th Annual Session, San Diego, April 30-May 3, 1950.

The background of Uncle Sam's early life shows that the individual was the beginning unit of efficiency. The city and county governments were the units of government comparable to the individual. The state government was dependent on the workings of the individual family groups, and the central government in the nation's capital was dependent upon the workings of the individual states in a cooperative liaison. Now, this system, the capitalistic system, had made this country the most envied of all countries. People from all over the world wanted to come into our country and through the years of its existence, the quota of people permitted to come each year has been completely filled and many people have to wait for years to get in. Yes, people even pay to get smuggled into this country, the country where all people are free and equal, with the right to life, liberty and the pursuit of happiness, dependent on their own efforts. They wanted to come here, for it was here that they could live where they chose to live, were free to speak their own minds, free from arrest and search without the warrant of law, free to own property, free to choose their own forms of occupation, free to spend their incomes as they thought best, free to worship the God of their choice. True, in exercising these freedoms, they were limited by the freedoms and the rights of others, but they had the right to make the wrong decisions in the exercise of each of them. The pursuit of happiness consisted of using their lives as they thought best so long as they did not infringe upon the same rights of others, to work a great deal or only a little, while seeking their happiness in whatever profitable or unprofitable avocation they chose. It included the right to use their incomes wisely or foolishly as they wished. Their pursuit of happiness was of their own choosing. This was the environment in which Uncle Sam grew up. This was the freedom which made him strong, virile and much sought after.

Now, as to the virus disease that has so gradually disintegrated such individuals as Johnny Bull, once the ruler of the seas, who once boasted, and rightfully so, that his borders were so far reaching that the sun never set on them. This disease was characterized by gradual onset. So insidious was it that it usually had invaded the hosts without any knowledge that a change was taking place. But, gradually it was noted that certain predominating characteristics of the person were changed. Certain remedies were advocated. Certain changes in mode of life were suggested to bring about health again. The Welfare State was advocated as the panacea; this to be given in teaspoonful doses so that too abrupt reactions would not take place. Thus, little by little did Johnny Bull get his Welfare State, and little by little did Johnny Bull get weaker. It took nine years of this daily spoonful dose of socialism before the effects of the medication showed up: A representative of that type of medication became a British cabinet officer. In five more years, Ramsay MacDonald, one of the medicators, was Prime Minister of England.

In 1949 these practitioners were in control of the medication of John Bull. The history of these changes that took place in England are well known to you all, but I mention them again because all of these changes which have gradually reduced this outstanding figure, John Bull, to a limping cripple unable to stand on his own feet without help, which have reduced the once ruler of the seas to the rank of midshipman, have come about because of this medication. The country he once represented so proudly now cannot exist without help. England's position as a frontline nation is threatened. Yes, England, under the regime of the socialists as it is today, will be able to hold on and exist as a figurehead only so long as it can get free billions of dollars as an aid from Capitalistic America, the land of free enterprise, not a welfare state.

You may ask what has this to do with the case of Uncle Sam. The answer is: The same formula that was used in reducing our friend Johnny Bull to a second rater is being used on Uncle Sam. He is gradually being inoculated by these social planners with such medicine as the Planned Economy System doles out. He was told that his system was run down and nothing would be so good for his welfare as this planned economy treatment, to be given to him by a group of men well qualified to spend other people's money. Uncle Sam, having just gone through a depressing illness in 1933, was really in a receptive mood for any advice or treatment that would revive him. So, he was ready to lend an ear to the suggestion that he "take the cure." So, called into Washington by our President were the Doctors of Planning, a conglomerate group. The old system of free enterprise was pushed aside to allow the government to enter into the picture in a more important light. In other words, it meant that the economic life of America must cease to be a free enterprise system, and the state, which heretofore was not to compete with or interfere with private industry, was now to be the master of industry, telling it what to do and how and when to do it. Twenty years ago, little did we think that we could be told for what price we could sell one of our products. We could set our prices and if someone wanted our products, they could buy. But no more. Now, these social planners have entered into our homes, and from Washington comes the order of the Planned Economists. The plight of the lowly spud is a case at hand. Old heads of the Department of Agriculture warned long ago that writing into farm policy price supports on perishables would end in the mess it is now. But they were not heeded by these new Planners, and that is one more chapter in the growth of Farm Planning. Similar crackpot advice on other controls has resulted in similar failures. Costly to the taxpayers? Yes, indeed.

So, for sixteen years or more, Uncle Sam has been under the influence of the do-gooders. It has made an impression on him. He has become jittery. For sixteen years he has heard nothing but the same jargon from the New Dealers. He has lost his ambition or has been so inoculated by these methods that he has become weakened and has come to believe that the government should do his thinking or planning for him, and he need not do any individual thinking or planning for himself.

These planners have strange philosophies that they would foist upon us. These philosophies would destroy all sense of personal responsibility. They would, if accepted, debase man and take from him his only initiative to reach a higher station. It would mean the loss of all initiative, of all individual responsibility. It would take from him everything that America has stood for. So, we must fight to preserve these principles that have made America what it is today.

As Edgar Ansel Mowrer, noted foreign correspondent, said, "Our leaders in Washington are not bad men, but they just do not know what to do." What a predicament. Why then should they advise us to follow the pattern of a nation or of nations that cannot compare with us on any basis? Why then should they try to change a mode of life here in the United States when nothing better can be offered? What is it they have to offer? Let us take England, for example, for from there comes most of the impetus to change. It is England that has made the most abrupt change of all. First, according to authentic reports, only 250 persons in Great Britain have incomes of $14,000 or more after taxes are collected. Before World War II and the change to Socialism, 11,000 persons were over the $14,000 income bracket. For this change, the Socialists are claiming an outstanding achievement. Second, a person in Britain formerly could jolly well choose where he would work. He could enjoy doing with his life what he chose, seeking his happiness and welfare where it might best be found. But what happened? A law was enacted, the notorious Control of Engagement Act, which states in effect that no man between the ages of 18 and 50, or woman between the ages of 18 and 40, can change occupation at will. The Minister of Labor has the power to direct such workers to the employment he considers best for the national interest. Third, the Briton's home was his kingdom. Now 10,000 officials in Great Britain have the power to enter private homes for inspection without search warrant. All this when war does not exist, when the nation is at peace.

Fourth, as to the status of medicine, we as medical men all are well aware of the catastrophe that has befallen England. But listen to a layman. Mr. Harold Stassen in a recent article in *Readers Digest* reported the following: During the first year of socialized medicine, the death rate in Britain went up rather sharply, industrial absenteeism because of illness was higher than in preceding years, there was a serious breakdown of hospital and medical care for elderly people. "The abrupt deterioration in the treatment of the sick is serious enough," said Stassen, "but the effect of the national health program on preventive medicine is tragic. Public Health work, measures for the prevention of diseases, either in existence or planned, have been retarded and even abandoned."

These reasons—and many more could be added—are reason enough why we must not allow Uncle Sam to get any more treatment from the economic planners.

The proponents of this planned economy have seen fit to advise Uncle Sam that to make him a healthier chap, he should adopt the scheme of socialized medicine as used in England, and thereby provide himself and all his children with every medical and hospital care necessary. They spout the false propaganda that then everyone would immediately get all of the medical care he had not been able to provide for himself, and free—at government expense. These propagandists tell us that the American people are not provident enough, nor intelligent enough to provide this care for themselves, as it is too costly. They make much of a statement that five billion dollars was spent in one year for medical care. However, they do not tell the people that eight billion was spent for liquor in one year, and four billion dollars for cosmetics. Neither do they tell us that our national income is equal to the combined national incomes of the next six nations (both before and since the last war). Nor, do they tell us that our workers can buy with their wages two times as much food, clothing, housing, travel, entertainment, education for their children as can workers at similar jobs in England, Sweden or Switzerland; and five times as much as in Russia. They do not tell us that we were the only nation that was able to arm itself adequately to meet the Axis powers; that we were the only nation that was able and is still able to lend liberally to our allies in that war; or that we are the only nation now able to lend its help to its neighbors.

No, they do not tell us all this when they try to propagandize the people about the cost of medical care. They have misused figures about the health of our nation. They have used the number of draft rejections as a basis for their theory that if we had compulsory health insurance, all of our young men would be physically fit for the draft. They did not reason very well, for the figures showed that only a small number had defects that were remedial. There was no recognition by them that the medical profession by no means was liable for the loss of arms, eyes, legs, hands, or for the mental deficiencies and illiteracy that caused a large percentage of rejections.

The medical profession wants to be able to give good medical care. We want the people in the United States to get all the medical care necessary. We want them to continue to get the good care they have been getting and even to improve that care, if possible. We want hospital care available to people when necessary. We want the high standard of medical school training continued. We want the continuation of the inspiring medical research that is going on. The question is, how best can this be accomplished? What are the barriers, if any, that hinder people from getting necessary medical and hospital treatment? Can these barriers be removed by a program of compulsion without breaking down the present good system? Can the present system be improved by one of compulsion, or should we stand on our record of achievement that has given the people of the United States as good medical care as can be given in any country of the world, and by a free enterprise system?

It is the opinion of organized medicine, well based on facts, that no critical condition exists in America which calls for such a revolutionary change in the mode of practice as is suggested by our President. It is the opinion of organized medicine, now shared by many other groups, that the type of medical care that could be given by compulsory payment, controlled by the government, would be inferior medical care, and that it would gradually deteriorate the quality of the system. It was the conclusion of the Brookings Report that no crisis existed in the health conditions of our nation that would call for such change in the American way of living. The report is summed up with the statement, "The United States is among the most healthful nations in the world."

Let us look at the health record of the United States.

First, the average life span has almost doubled since Uncle Sam was born. The life expectancy, based on insurance actuarial studies, is now 67 years against a former 38.

Second, there has been a 40 per cent reduction in the average death rate since 1900, which means a saving of almost a quarter million lives a year, due to our progress in 50 years.

Third, infant mortality rate has been reduced one-half in the last 25 years.

Fourth, over half of the more than four million babies born in 1948 will be alive at the age of 72, according to actuarial studies, whereas 50 years ago only one-half would be alive at the age of 58.

Fifth, maternal death rate has been reduced four-fifths in the last 25 years.

Sixth, the following diseases that once ravaged the American people, have been virtually wiped out, or the mortality from them is negligible: smallpox, scarlet fever, typhoid fever, malaria, whooping cough, infant diarrhea.

Seventh, effective treatment is available for diseases such as diabetes, pneumonia, pernicious anemia.

Eighth, the operative mortality in many cases has been reduced by better trained medical personnel and better hospitalization. The new operative treatments for many conditions that formerly were almost always fatal are now reassuring.

Ninth, the elevation of the standards of hospitals is one outstanding achievement. Their inspection and accrediting assures the public of safe care.

Tenth, the eradication of substandard medical schools and the elevation of standards of existing medical schools has made for better prepared medical graduates.

Eleventh, the war against quacks in medicine, and against the dangerous nostrums (now controlled by the Food and Drug Act) is to the credit of organized medicine.

A survey of these facts should be most reassuring. The story is one of progress on all fronts, and it is really most remarkable. We admit that there are problems of medical care that do exist in certain parts of the United States, but they are not of such character as to justify a radical change in the policy of carrying on our system of medical and health care that has such a record to its credit as I have just recited. No, there is no health crisis!

There is another side to the problem of medical care in addition to the medical aspect, and that is a very important phase of the whole problem. That is the financial one. There is no doubt that the average American has had reason to fear the financial burden of unpredictable, extensive medical and hospital care, especially hospital and surgical costs. There are two factors involved if the wage earner is the one afflicted. His earnings are stopped and his surplus is spent, if he is not protected by some form of insurance. Consciousness of the desirability of some protection against such inroads on the family budget has grown and is now widespread. Because of this consciousness, we now have the hospital care insurance programs which have resulted in the Blue Cross organization. Now over 32 million persons are protected from the catastrophic costs of sudden illness.

The insurance companies followed the lead of the Blue Cross organization and started group hospitalization plans, and in addition in the last few years many people have been covered by consumer-sponsored organizations and by labor unions. The number of people now covered is estimated to be over 61 million.

At about the same time the Blue Cross hospitalization plans developed, group insurance to meet medical and surgical costs was instituted. The Michigan Plan, Kings County, Washington, Oregon plans, California Physicians' Service, and many others are examples. To date over 35 million people have been insured by all types of organizations in this field. In 1948, the gain in this type of coverage was nearly eight million.

Many experimental types of policies have been tried by the companies that handle this type of coverage, in an attempt to properly cover the individual. We recognize, of course, that there is plenty of room for growth and development in both the hospitalization and medical and surgical care programs, in the scope of their coverage and in their inclusions. Certain basic principles must be applied to all of these plans:

1. The patient must get adequate medical and hospital coverage.

2. There must be free choice of physician.
3. There must be protection against abuse of the plan by both the patient and the doctor.
4. The plan must be basically sound financially.
5. It must be a voluntary plan, not a government administered plan.

As yet, no plan has been evolved that can include everyone. There are some people who will budget everything but the cost of sickness. Some cannot yet afford it. Others will not protect themselves if they can afford it. But, because no all-inclusive plan has been developed since such plans have been inaugurated is no reason why the government should take over and spoil all the plans that have been effected. Oscar Ewing admitted that if the government health plan were enacted, the Blue Cross and other plans would be forced out of business as a result.

Private enterprise has to keep these plans on a sound financial basis; it cannot compete with a ready-spending government bureau. Many hastily promoted pension plans and health plans will sink under their own weight, or some of the services will have to be curtailed. Let us not be in too great haste to adopt some of the numerous plans that are being offered by some of our legislators. A certain hysteria has developed in Washington because of the impending threat of the bureaucratic schemes, but let us not be stampeded into accepting some plan which will finally result in the American public's getting poorer medical care.

I appeal to the medical profession to stand firm on the gradual, careful planning by the parties that are interested in giving protection to the people. There should be conferences of the Blue Cross, Blue Shield groups, of the insurance groups and of the financial experts to the end that more people will finally be included in the plans, with perhaps longer coverage, and perhaps some deductible plan in which the patient would share in the initial expense. All these variations are being tried, but so much pressure is being applied to them that the groups are becoming panicky and unable to think clearly. We should not permit destruction of what has been accomplished in these last 20 years.

We know that Uncle Sam is sick. No one can deny that. Under the administration of a free-spending group of economic planners, we have been saddled with a national debt that our offspring will have a hard time paying off. Our foreign relations are in bad condition. Instead of being respected, we are held in ridicule. The bureaus in Washington are becoming too numerous and overlapping. We have too many people on government payrolls. What, then, should we do?

We should alert ourselves to the fact that we have other responsibilities than that of caring for the sick. We should accept our duties as citizens as well. We should interest ourselves in civic affairs and pay more attention to some of the jobs we have delegated to others. We should be *voters.*

We should sweep Washington clean of these elected officials who are planning to abolish our free enterprise system. We should see that the disloyal civil service employees in government service are discharged. We should replace these people with Americans who believe individual effort should be rewarded. We should stop unnecessary spending that is making the nation financially unsound. We men of medicine should be permitted to go on and develop better methods of caring for the sick, and, with competent help and consultation, be permitted to work out a voluntary prepaid health service so that every person who wishes to do so will be able to share in it.

Yes, let us give Uncle Sam an injection of some of the Spirit of 1776, to the end that his drooping shoulders will be straightened, his head will be again held high, his back straight and once again with Liberty on his arm, he will march forward.

241 East Santa Clara Street.

Newer Methods for Selection of Patients for Lumbar Sympathectomy

TRAVIS WINSOR, M.D., *Los Angeles*

SUMMARY

The degree of vasodilatation achieved by various diagnostic methods (arterial occlusion, ganglionic block established by certain agents, lumbar sympathetic block, spinal anesthesia, and indirect heating) was studied by means of the pneumo-plethysmogram as well as through readings of skin temperature and skin resistance. The data obtained were interpreted as to their value in determining the type of patient with vascular disease for whom lumbar sympathectomy would be of noticeable benefit. Arterial occlusion proved itself a rapid and simple method which in most patients produced satisfactory results. As a rule, lumbar sympathectomy was effective in patients who preoperatively had shown a positive response upon release of arterial occlusion. A negative response, that is, absence of significant increase in blood flow, does not necessarily indicate organic disease, and cannot be taken to mean that lumbar sympathectomy would always be ineffective. Ganglionic block, using 2.6 dimethyl piperidinium bromide or tetraethylammonium ion, was generally less reliable in indicating the probable results of sympathectomy than lumbar sympathetic block or indirect heating. Lumbar sympathetic block with procaine was followed by a greater increase in skin temperature and blood flow than spinal anesthesia, and permitted far more accurate conclusions as to the probable outcome of sympathectomy. Subsequent to indirect heating the plethysmogram showed characteristic differences depending on the degree of vascular disease present. From the effect of this simple, safe and painless method upon the relative blood flow to the toe it becomes possible to arrive at a comparatively accurate estimate of the clinical benefit to be expected from lumbar sympathectomy.

THE importance of lumbar sympathectomy as a surgical procedure for the treatment of selected patients with peripheral vascular disease is by now fully recognized. This operation, however, does not in all instances lead to uniformly good results, and certain patients show no significant improvement while in others even an exacerbation of the disease can be noted. It is the purpose here to discuss certain diagnostic methods which have proved helpful in a proper selection of patients for lumbar sympathectomy.

The present report is based on a study of 150 unselected cases; the youngest of the patients was 18 years of age, the oldest 78; the average age was 48 years. All experiments were conducted in a constant temperature room with a temperature of 25° C. ± 1.5°. The conditions of these studies were rigidly controlled and have been described elsewhere.[11]

Various methods of investigation were employed simultaneously, including a study of vasomotor reactions and blood flow[2, 3] by means of the pneumo-plethysmograph; continuous readings of skin temperatures were taken with an electronic recorder, and sweating was measured with a dermometer.[6, 7, 8, 10] Vasomotor changes resulting from application of one or several of the following test methods were noted: (1) arterial occlusion; (2) blocking of the autonomic ganglia by certain chemical agents; (3) lumbar sympathetic block; (4) spinal anesthesia, and (5) indirect heating.

Of the total number of subjects examined, 52 were normal, while in 98 peripheral vascular disease was found to be present. In this latter group arteriosclerosis obliterans was noted in 86 per cent and thromboangiitis obliterans in 14 per cent. On the basis of clinical observations and independent of the precise nature of the vascular involvement, two sub-groups were established: In 60 patients (of a total of 98) arterial disease was described as moderate, without ulceration of the digits; in the remaining 38, pronounced arterial disease with ulceration was observed.

Lumbar sympathectomy was performed in 25 instances, and the patients were observed before as well as after operation; the diagnosis in 16 cases was moderate and in eight cases pronounced arterial disease; and in one case it was hereditary lymphedema without arterial disease. In all instances of lumbar sympathectomy at least the second and third lumbar ganglia were removed.

From the Department of Medicine, University of Southern California Medical School, and the Nash Cardiovascular Foundation, Hospital of the Good Samaritan, Los Angeles.

Presented as part of a Symposium on Heart Disorders arranged jointly by the Section on General Medicine and the Medical Division of the California Heart Association at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

Gratitude is expressed to Dr. B. O. Raulston for the encouragement and cooperation extended during these studies.

Several methods for the determination of the degree of vascular disease were tested in order to establish their reliability as indicators of the benefit which may be expected from lumbar sympathectomy. Arterial occlusion was performed in half the number of all individuals studied, whenever feasible for a period of 15 minutes; in many cases, however, it proved impossible, on account of the patient's condition, to apply this method longer than five minutes. Of 75 subjects, 52 had arteriosclerosis obliterans or thromboangiitis obliterans of the extremity, while the remaining 23 were normal. Two patients suffered injury at the site of arterial occlusion, and in an equal number the test could not be completed by reason of pain caused by the procedure. In all 25 instances in which lumbar sympathectomy had been performed the effect of arterial occlusion was studied seven to 14 days after the operation.

The following technique was employed in order to produce arterial occlusion: The patient was placed in the supine position and the limb was elevated for 30 seconds. A blood pressure cuff was applied above the knee and inflated to 60 mm. of mercury above systolic pressure. The limb was then returned to the horizontal position. After five or possibly 15 minutes the cuff was suddenly released. The blood flow of the toe was recorded every 15 seconds until a maximum flow was reached. This method is simple as well as efficient, but the data obtained will prove reliable only if the test is conducted under ideal experimental conditions, because a startling sound, pain, anxiety, and chilling of body surfaces are apt to decrease the flow of blood.

On the basis of observations following arterial occlusion for a period of five minutes, three types of reactions could be distinguished; in normal subjects the total blood flow increased rapidly after the occluding cuff had been released, and only little change in the skin temperature of the toe was observed. Among patients with moderate vascular disease the same response occurred, yet to a lesser degree. Among those with pronounced vascular disease little or no change occurred in either blood flow or skin temperatures. When the skin temperature changes were compared with changes in blood flow following release of the arterial occlusion it was apparent that definite increases in blood flow were usually accompanied by insignificant increases in skin temperature. Thus the plethysmographic method of evaluating the effects of arterial occlusion was much more sensitive than the measurement of skin temperature.

An increase in blood flow following arterial occlusion suggests that lumbar sympathectomy would be beneficial; in cases in which this diagnostic method, properly performed, results in only a small increase of the flow or fails to have any effect, it has been concluded that the operation would be of questionable benefit.

Exceptions to this rule are patients who have intense vasospasm not accompanied by any signs of organic vascular disease. In these cases arterial occlusion may be followed by only a small increase in the blood flow while, on the other hand, lumbar sympathetic block as well as lumbar sympathectomy result in a definite increase of the blood flow.

In the 24 patients with arterial disease who were subjected to lumbar sympathectomy the rate of blood flow obtained preoperatively through arterial occlusion of five minutes' duration was compared to that established seven to 14 days after operation. It was found that in four cases the rate had increased, while in 16 others the figures were unchanged, and in the remaining four the blood flow was postoperatively lower than preoperatively. Similarity of the figures resulting from preoperative arterial occlusion and observations following lumbar sympathectomy may, however, be due to different physiologic processes: Release of the occlusion cuff may produce an increase in flow to the deeper tissues of the digit, while lumbar sympathectomy may result in an increased flow to the skin.[9]

Arterial occlusion has been made the basis of another clinical method of determining the degree of vascular disease in a limb. Less time elapses in healthy limbs before the extremity becomes erythematous after release of the cuff than when organic disease is present. It is, however, difficult to time accurately the appearance of erythema following release of the cuff, and in the present study this method was therefore not considered reliable in estimating the effect of sympathectomy.

Ganglionic block was produced in 15 subjects in order to observe the peripheral vascular effect of this procedure and to evaluate its usefulness in the selection of patients for lumbar sympathectomy. The quaternary amine, SC 1950 (2.6 diethyl piperidinium bromide)* was employed in all instances, and in some cases an additional test was made with tetraethylammonium ion (Etamon®).[1, 4] SC 1950 was administered by slow intravenous injection, the dose amounting to 0.5 mg. per kilogram of body weight.

In nine of these 15 cases it was possible to examine the patient seven to 14 days after lumbar sympathectomy, and thus to compare the postoperative values with the data obtained through preoperative ganglionic block. In this sub-group the diagnosis in eight instances was advanced arteriosclerosis obliterans, while in one instance it was early thromboangiitis obliterans. Upon ganglionic block the skin temperature of the toes rose in this last mentioned patient from 28° to 34° C., and the corresponding total blood flow increased from 1.0 to 8.0 cu. mm. per 5 cc. per second. These observations suggested that lumbar sympathectomy would be of value in this case, and definite clinical improvement followed the surgical procedure. Fourteen days postoperatively the skin temperature was 34.5° and the blood flow 10 cu. mm. per 5 cc. per second. All eight patients with advanced obliterative arteriosclerosis of the limb showed also greater increase in skin temperature as well as in blood flow seven to 14 days after sympathectomy than they had shown following injection with SC 1950. The increase following preoperative ganglionic block produced by tetraethylammonium ion (Etamon) was similarly lower than the postoperative readings.

---

* Furnished by Research Laboratories, G. D. Searle & Co.

The peripheral vascular effect of blocking of the autonomic ganglia with SC 1950 or Etamon is smaller than that immediately following lumbar sympathectomy. This finding may be explained through the fact that ganglionic block results in generalized vasodilatation, and the blood is thus shunted away from the diseased limb.[5]

It may be advisable to report concomitantly on the diagnostic value of lumbar sympathetic block and of spinal anesthesia, using procaine. Forty patients with arteriosclerosis obliterans were studied by either the one or the other of these methods.

Lumbar sympathetic block was produced by introducing one, two or three needles in the region of the second, third or fourth lumbar ganglia, and 10 cc. of a 2 per cent procaine solution was injected at one or all of these sites. This procedure is reasonably painless and leads in the majority of cases to satisfactory results. It is, however, advisable to perform lumbar sympathetic block in the clinic or the hospital, as the danger of infection, neuritis, and various reactions to procaine can never be entirely excluded.

Dryness of skin occurring within 10 or 20 minutes after injection was taken as a sign that the block had been successfully established. Blood flow to the skin was estimated from the skin temperature and digital flow recorded in the plethysmogram. Readings of the dermometer proved of considerable value, as the absence of sweat following procaine injection signified a lowering of the skin resistance and indicated in turn that infiltration of the sympathetic ganglia had been achieved.

A submaximal increase in the skin temperature as well as of the peripheral flow following lumbar sympathetic block constitutes evidence suggestive of organic arterial disease. In ten instances, lumbar sympathectomy was subsequently performed, and it was thus possible to compare the results of preoperative lumbar sympathetic block with the effects of operation, seven to 30 days after operation. It developed that in all those cases in which the lumbar sympathetic block was not followed by a significant fall in systemic blood pressure, the measurements of blood flow as well as the readings of skin temperature were similar subsequent to lumbar sympathetic block and following lumbar sympathectomy.

Spinal anesthesia was studied in five patients who later were subjected to lumbar sympathectomy, but its diagnostic value proved to be inferior to that of lumbar sympathetic block. Spinal anesthesia effected by slow injection of 100 mg. of procaine, was performed by a trained anesthetist, and a satisfactory level of skin anesthesia resulted in all cases. However, rise in skin temperature and blood flow of the affected limb as well as the amplitude of pulsation as recorded in the plethysmogram were far less pronounced than following satisfactory lumbar block.

This relatively poor effect of spinal anesthesia upon the blood flow in the toe can in all probability be traced to vasodilatation in both lower extremities combined with a fall of the systemic blood pressure. Such an effect is obviously less desirable than vasodilatation restricted to a single limb, while at the same time the systemic blood pressure remains at the pre-injection level.

The following experiment may exemplify the limited degree to which spinal anesthesia produces vasodilatation. A patient with partial occlusion of the femoral artery had an initial rate of blood flow in the toe of 0.5 cu. mm. per 5 cc. per second. After spinal anesthesia the rate of flow doubled. Ganglionic block using SC 1950 reduced the flow to 0.1 cu. mm. per 5 cc. per second, a fact probably due to the so-called borrowing-lending phenomenon.[5] Lumbar sympathetic block produced a rise of blood flow to 2.5 cu. mm. per 5 cc. per second, while following arterial occlusion of five minutes' duration the flow increased to 3.5 cu. mm.

INDIRECT HEATING

A new method for the selection of patients for lumbar sympathectomy has been developed at the Nash Cardiovascular Foundation. It is an established fact that heat exerts a definite influence upon the blood flow to the extremities. Yet, up to the present the effects of body heating have usually been recorded by measuring the skin temperature. In this manner, merely an approximate estimate of blood flow to the extremity could be obtained, as the skin of the digit responds only slowly to the application of heat to the body. By means of the plethysmogram it has now become possible to ascertain the finer, often rapidly changing details of total blood flow to the digit. The data obtained through this simple, safe and painless method serve as a basis for the evaluation of the state of peripheral circulation, and permit an estimate of the probable outcome of lumbar sympathectomy.

The patients treated with indirect heat may be arranged into three groups: (1) Patients without arterial disease; (2) patients with organic arterial disease without ulceration of the extremity; and (3) patients with organic arterial disease with ulceration of the extremity. If possible, the degree of peripheral vasodilatation was studied prior as well as subsequent to lumbar sympathectomy.

Two double-sized electric pads were applied to the body of the patient. The vasomotor reactions following indirect heating were studied by means of continuous tracings of the plethysmograph as well as of the electronic recorder of skin temperature, while the relative blood flow to the toe was calculated at periodic intervals.

The plethysmogram was analyzed with special attention to the pulse wave which was recorded on photographic film traveling at the same rate of speed as that of the standard electrocardiograph, and also in relation to the alpha, beta and gamma waves, which were recorded on film traveling at the rate of four inches per minute. The relative toe flow was calculated from the slant of the base line of the plethysmogram, which in turn represented the rate of swelling of the toe following venous occlusion at the ankle.[3]

Among 20 normal individuals, resting in a comfortable environment, the pulse, respiration, alpha and beta waves occurred 76, 14, 6 and 1 times per minute, respectively. Gamma waves were observed at a frequency of less than one cycle per minute. A study of the plethysmogram of ten normal individuals at different body temperatures gave the following results: Body cooling was attended by lowering of the pulse, respiration, alpha, beta and gamma waves, combined with a reduced relative toe flow. Body heating, on the other hand, produced high pulse waves with a prominent dicrotic notch, combined with small alpha, beta and gamma waves, and an increase of the relative toe flow. Intermediate degrees of body heating resulted in pulse waves of variable amplitude and large alpha, beta and gamma waves.

The influence of indirect heating upon a patient without arterial disease is presented in Figure 1. This patient, a 17-year-old girl, entered the hospital because of edema of the legs of eight years' duration. A diagnosis of hereditary lymphedema was made. The arterial systolic blood pressure gradients, oscillometric readings and peripheral pulsations were normal. With the patient resting in a warm, comfortable environment (Figure 1-A) the pulse waves were of variable amplitude, and there appeared distinct modifications in digital volume. This variability is entirely normal for a slightly warm, relaxed individual. The filling and emptying of the toe with blood (alpha and beta waves—Figure 1-A) represent in all probability vasomotor changes normally occurring in the process of regulation of body temperature. The relative toe flow was 5.0 cu. mm. per 5 cc. per second. Body heating for 30 minutes (Figure 1-B) resulted in an increase in the amplitude of pulse waves and at the same time in a decrease in the amplitude of alpha and beta waves, indicating a high degree of vasodilatation. The relative toe flow rose to 21.5 cu. mm. per 5 cc. per second. Bilateral lumbar sympathectomy was performed against advice. The patient was again observed three years later, and the plethysmogram at that time (Figure 1-C) showed pulse waves of high amplitude, in combination with small alpha and beta waves; the relative toe flow was 13.0 cu. mm. per 5 cc. per second. These findings, especially the ab-

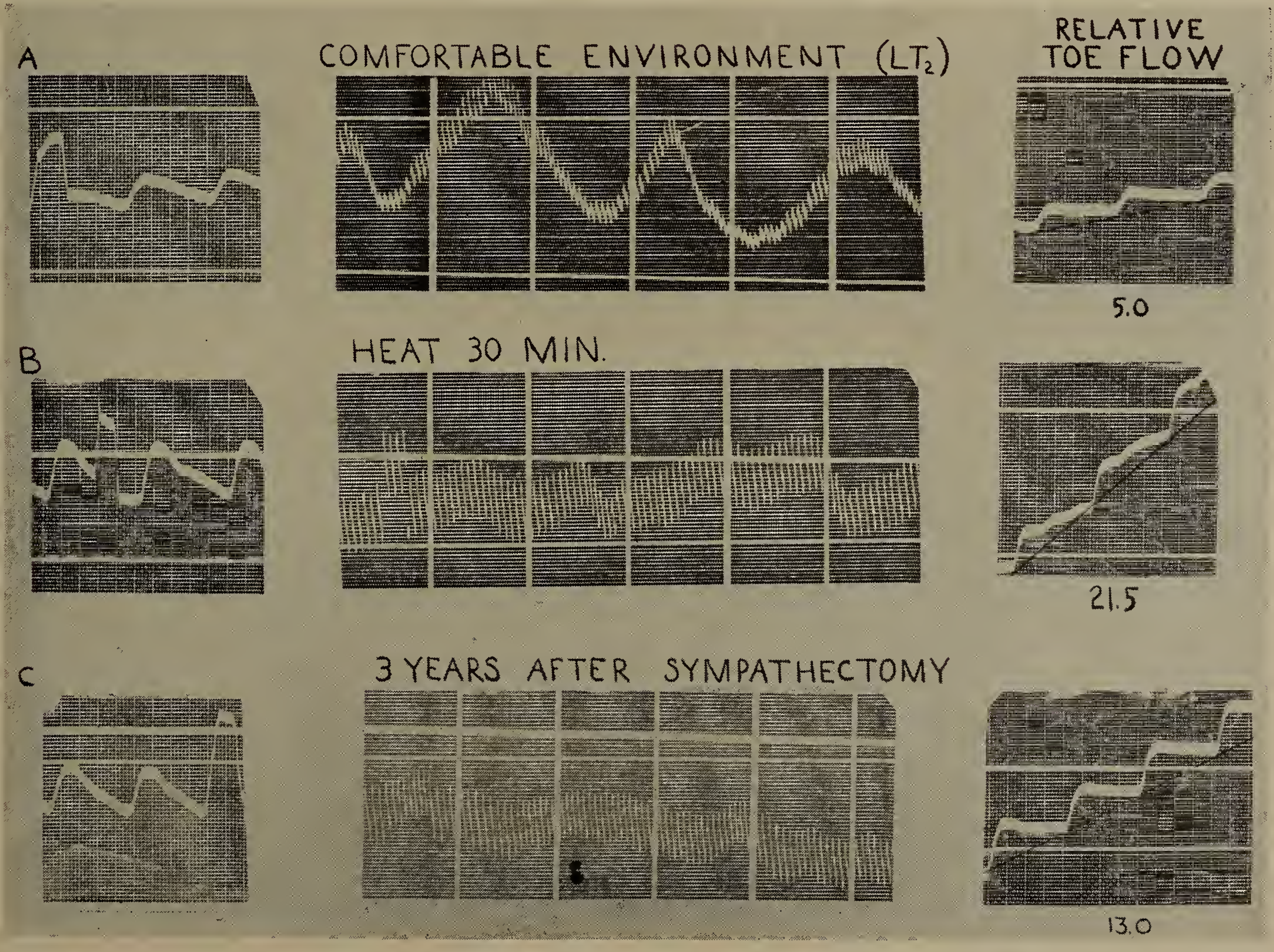


Figure 1.—Influence of body heating and lumbar sympathectomy on vasomotor activity and blood flow of the toe in a patient without arterial disease. Evidence of normal vasomotor activity suggested that lumbar sympathectomy would effectively increase the circulation to the extremity.

sence of spontaneous variations in toe volume, as apparent in the smallness of the alpha and beta waves, demonstrated that sympathectomy had been effective in decreasing vasomotor activity in the toes, and that this result persisted even after a period of three years.

Twelve patients with moderate arterial disease were examined by applying indirect heat, and in all instances it was found that lumbar sympathectomy resulted in moderate clinical improvement. This type of reaction is exemplified in Figure 2. A 34-year-old man with moderate arterial disease entered the hospital one and one-half years after fracture of the right leg. Examination showed definite skin changes with erythema and atrophy of the tissues of the toes. The right leg was three degrees cooler than the left. Pulsations in the right dorsalis pedis and posterior tibial arteries were absent. The plethysmogram of the second toe, right, with the patient resting in a comfortable environment, showed small pulse waves with little evidence of vasomotor activity. The relative toe flow amounted to 2.4 cu. mm. per 5 cc. per second (Figure 2-A). After body heating, the amplitude of the pulse waves increased four times and respiratory, alpha and gamma waves became apparent. The relative toe flow rose to 6.0 cu. mm. per 5 cc. per second (Figure 2-B). This increase in the amplitude of the pulse wave and the small increase in the relative toe flow together with the evidence of slight vasomotor activity suggested that moderate improvement could be expected from lumbar sympathectomy. An examination on the seventh postoperative day (Figure 2-C) demonstrated that the pulse waves were higher than they had been with the patient resting in a comfortable environment before body heating had been applied; the relative toe flow amounted to 5.4 cu. mm. per 5 cc. per second. Clinically the patient was moderately improved.

The influence of body heating upon the plethysmogram of patients with organic arterial disease and ulceration of the extremity was studied in eight cases in which lumbar sympathectomy was subsequently performed. The pattern of cases of this type is exemplified in Figure 3. The plethysmogram of a 58-year-old female with extensive arteriosclerosis obliterans of the popliteal artery combined with ulceration of the digits, made while the patient was resting in a comfortable environment, showed no pulse waves and no evidence of vasomotor activity. The relative toe flow was only 1.4 cu. mm. per 5 cc. per second (Figure 3-A). After 15 minutes of body heating, small beta waves were seen and the relative blood flow in the toe increased to 4.2 cu. mm. per 5 cc. per second (Figure 3-B). After 30 minutes of body heating vasomotor activity disappeared again,

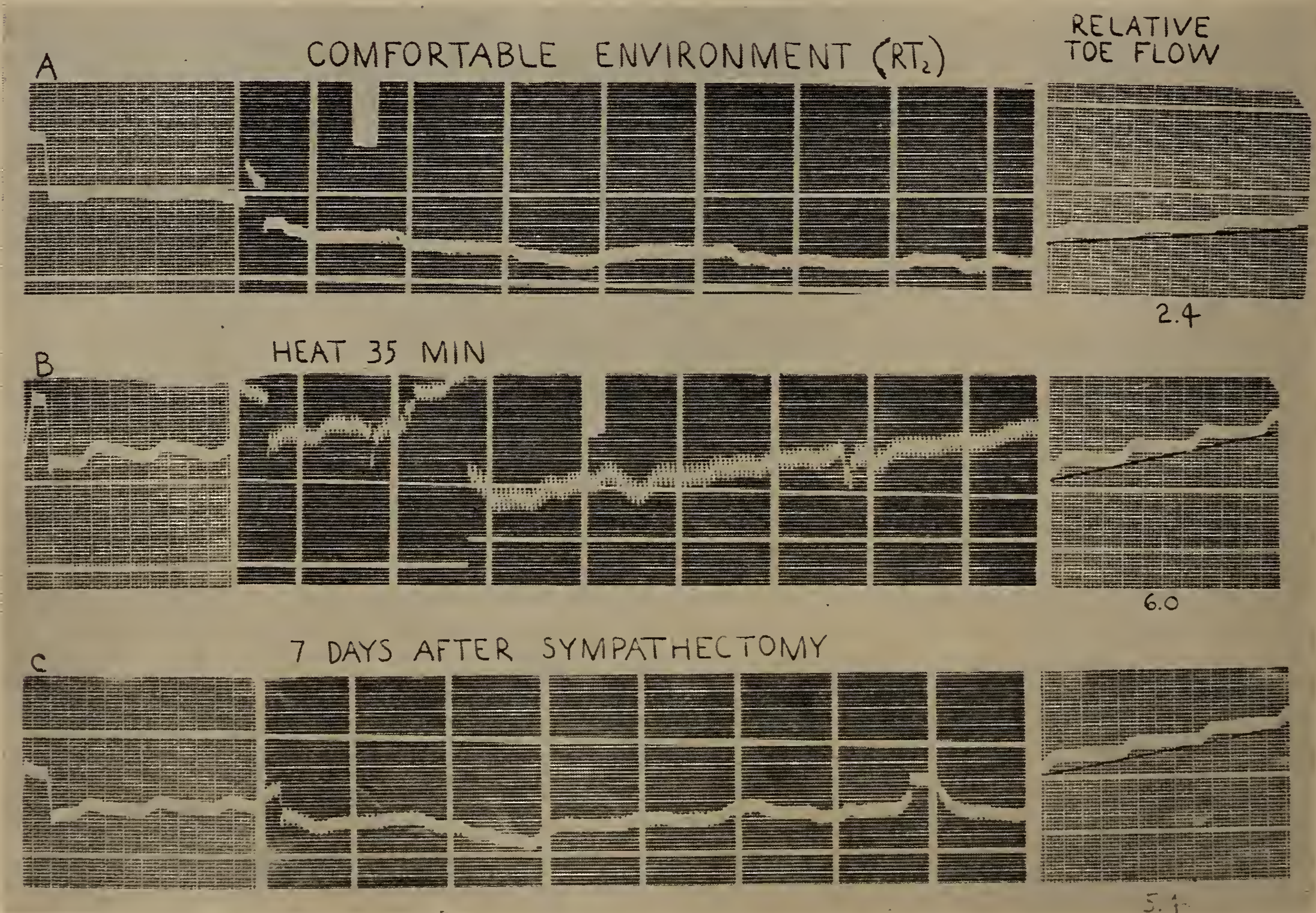


Figure 2.—Influence of body heating and lumbar sympathectomy on vasomotor activity and blood flow of the toe in a patient with moderate arterial disease following fracture of the right leg. Evidence of moderate vasomotor activity was present, and a fair degree of improvement was noted following lumbar sympathectomy.

and the relative blood flow in the toe decreased to 2.8 cu. mm. per 5 cc. per second, probably due to the borrowing-lending phenomenon[5] (Figure 3-C). These findings led to the conclusion that lumbar sympathectomy would not be of great help in this case. However, an operation was performed against advice. Plethysmographic studies, 30 days postoperatively, presented no evidence of vasomotor activity. The relative blood flow in the toe was only 3.0 cu. mm. per 5 cc. per second (Figure 3-D). As the patient's condition was not improved by lumbar sympathectomy, the leg had to be amputated three months later.

In none of the eight patients who, under the influence of indirect heating, produced a plethysmogram of this type did lumbar sympathectomy result in satisfactory clinical improvement. Subsequent amputation became necessary in two cases; one patient had an ulcer which refused to heal in more than one year's time; in five other instances no essential changes were noted following lumbar sympathectomy.

On the basis of a comparison of the three types of plethysmograms with the therapeutic effect obtained in each group through lumbar sympathectomy, the following conclusion seems to be warranted: The appearance of large alpha and beta waves in the course of body heating indicates the presence of an active vasomotor response and suggests that lumbar sympathectomy may materially increase the blood flow through the digits. Conversely, the absence of these waves following body heating suggests that lumbar sympathectomy would be of little benefit.

DISCUSSION

Plethysmographic studies are of great aid in the proper selection of patients for lumbar sympathectomy. In this respect it is of special importance that

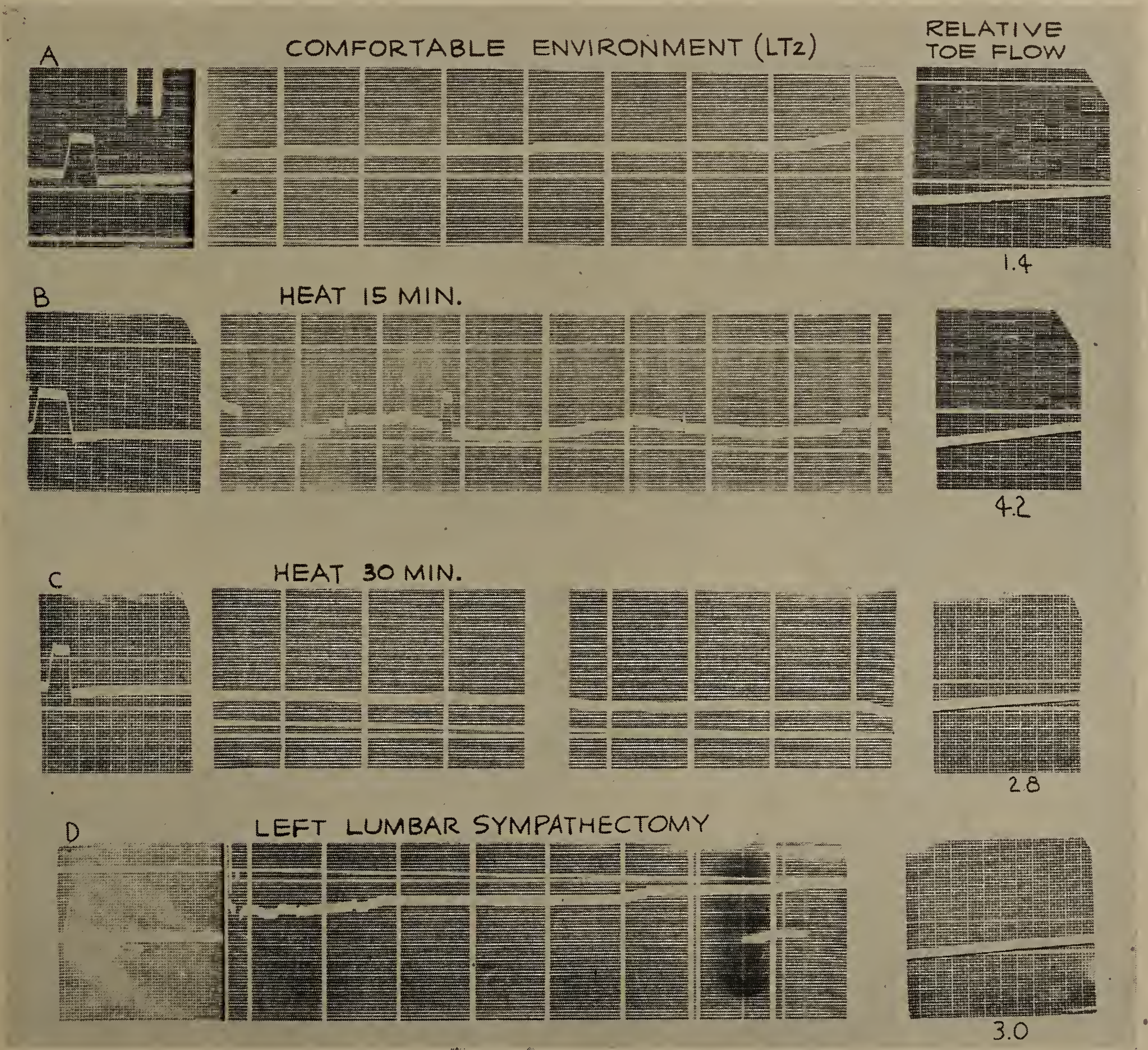


Figure 3.—Influence of body heating and lumbar sympathectomy on vasomotor activity and blood flow of the toe in a patient with advanced obliterative arteriosclerosis of the popliteal artery. There is little evidence of vasomotor activity and the results of sympathectomy were poor.

by this method it becomes possible to compare and evaluate the results obtained through various diagnostic procedures, as for instance arterial occlusion, ganglionic block, lumbar sympathetic block, spinal anesthesia, and indirect heating.

The plethysmograph is designed to measure the changes in the volume of an organ, and it is thus possible to estimate the total flow through that part, and not only the flow through the skin alone, as it is the case when merely the skin temperature is recorded. It happens occasionally that following lumbar sympathetic block the skin temperature of the digit rises while at the same time the plethysmogram remains essentially unchanged and the total flow, therefore, is not increased. Such findings suggest that under the influence of lumbar sympathetic block the distribution of the blood supply, but not the volume of the flow, has been modified, thus depriving the deeper tissues of the toe in order to increase the superficial blood circulation.

Many factors have to be taken into consideration in the interpretation of the plethysmogram, as identical wave forms may be due to entirely unrelated conditions. This applies especially to the psychic state of the individual. Tense, anxious, neurotic patients usually present plethysmograms with wave forms of low amplitude as well as a reduced volume of blood flow, characteristic of vasoconstriction. The plethysmogram of a relaxed, normal individual, at ease in a comfortable warm environment, on the other hand, shows large wave forms of variable sizes, indicating labile vasomotor activity. Transitory disturbances in the patient's environment such as irritating noises, drafts or chilling of body surfaces are likewise apt to produce low wave forms similar to those encountered in patients with organic vascular disease. In this case, however, differential diagnosis usually meets no great difficulties. Once these extraneous factors have been excluded, for instance through the application of heat to the body of the patient, the plethysmographic wave forms return to a normal shape, provided of course, the patient is not suffering from organic vascular disease. Sometimes the appearance of low wave forms can be traced to certain technical errors; faulty adjustment of the plethysmograph, for example, can lead to constantly substandard values, and a similar effect may also be brought about by incorrect measurement of the volume of the digit. Minor mistakes of this type are easily avoided by proper attention to detail.

By use of the plethysmograph it has become possible to evaluate the various diagnostic procedures available for the selection of subjects for whom lumbar sympathectomy may be of therapeutic benefit; but from the results obtained the conclusion is suggested that no one single method is applicable to all individuals. Among patients presenting relatively healthy tissue of the extremities without abnormal cutaneous sensitivity, the method of vasodilatation following arterial occlusion for a period not exceeding 15 minutes was employed with satisfactory results. In those cases in which peripheral vascular disease was still in its early stages, the increase in the relative rate of blood flow was rapid, indicating that lumbar sympathectomy could be expected to lead to pronounced improvement in the patient's condition. Because of tenderness or disease of the tissues of the extremity it was in many cases considered advisable to limit arterial occlusion to a period of five minutes. Increase of blood supply in the extremity following a shorter period of occlusion was smaller than when the flow had been arrested for a longer time. But when, after due allowance had been made for this discrepancy, it was found that the rate of blood flow had satisfactorily increased following arterial occlusion, lumbar sympathectomy was generally recommended. Yet, whenever the blood flow showed only a small increase after release of the occlusion cuff, it was decided that additional tests were required in order to obtain more definite data, and as a rule indirect heating or lumbar sympathetic block were instituted.

Evaluation of the effect of lumbar sympathetic block, as recorded in the plethysmogram, proved very helpful in the selection of patients for sympathectomy. This method, however, is not suitable for certain patients, especially debilitated or non-cooperative individuals or those sensitive to procaine. Skin resistance in the toe was carefully measured before, during and after infiltration of the sympathetic ganglia, in order to ascertain whether the lumbar sympathetic block had been successfully established. Whenever the plethysmogram demonstrates that the blood supply of the toe is considerably increased under the influence of lumbar sympathetic block, it may be expected that lumbar sympathectomy would be successful.

Of all diagnostic procedures applied, spinal anesthesia and ganglionic block using various agents proved least satisfactory. This finding is probably due to the fact that both methods lead to widespread vasodilatation.

Peripheral vasomotor activity can be conveniently analyzed after existing vasoconstriction has been relieved through indirect heating. Good results of lumbar sympathectomy may be expected in those cases in which, under the influence of body heating, the plethysmogram shows pulse waves of high amplitude with dicrotic notches, as well as prominent alpha and beta waves, combined with a high relative toe flow. Inasmuch as the alpha and beta waves are largely the result of sympathetic activity, it may be expected that whenever body heating leads to a greatly increased blood flow to the periphery, lumbar sympathectomy will produce a similar effect. With the progress of vascular disease a decrease in the amplitude of all waves in the plethysmogram is noted, especially during body heating, and at the same time the clinical improvement of the patient following lumbar sympathectomy is less striking.

The technical assistance of Grayce S. Fleming is gratefully acknowledged.

REFERENCES

1. Acheson, G. H., and Moe, G. K.: The action of tetraethylammonium ion on the mammalian circulation, J. Pharm. and Exper. Therapy., 87:220-236, July 1946.

2. Burch, G. E.: A new sensitive portable plethysmograph, Am. Heart J., 33:48-75, Jan. 1947.

3. Landowne, M., and Katz, L. N.: A critique on the plethysmographic method of measuring blood flow in the extremities of man, Am. Heart J., 23:644-675, May 1942.

4. Lyons, R. H., Moe, G. K., Neligh, R. B., Hoobler, S. W., Campbell, K. N., Berry, R. L., and Rennick, B. R.: The effects of blockade of the autonomic ganglia in man with tetraethylammonium, Am. J. Med. Sc., 213:315-323, March 1947.

5. Ray, T., Burch, G. E., and DeBakey, M. E.: The "borrowing-lending" hemodynamic phenomenon (hemometakinesia) and its therapeutic application in peripheral vascular disturbances, New Orleans Med. and Surg. J., 100:6-15, July 1947.

6. Richter, C. P., and Woodruff, B. G.: Changes produced by sympathectomy in the electrical resistance of the skin, Surgery, 10:957-970, Dec. 1941.

7. Richter, C. P., and Woodruff, B. G.: Facial patterns of electrical skin resistance—their relation to sleep, external temperature, hair distribution, sensory dermatomes and skin disease, Bull. Johns Hopkins Hosp., 70:442-459, May 1942.

8. Shumacker, H. B., Jr.: The value of skin resistance studies in determining the accuracy of procaine injections of the sympathetic nerves, Surgery, 11:949-961, June 1942.

9. Stein, I. D., Harpuder, K., and Byer, J.: Effect of sympathectomy on blood flow in the human limb, Am. J. Physiol., 152:499-504, March 1948.

10. Whelan, F. G., and Richter, C. P.: Electrical skin resistance technique used to map areas of skin affected by sympathectomy and by other surgical or functional factors, Arch. Neurol. and Psych., 49:454-456, March 1943.

11. Winsor, Travis: Influence of sodium tetrathionate on rate of blood flow to the digits, Proc. Soc. for Exper. Biol. and Med., 68:34-39, May 1948.

* * *

Correction

Table 2 in the article "Clinical Potassium Problems" which appeared in the March 1950 issue of CALIFORNIA MEDICINE contained an error. Item 6 in that table (page 136) under the heading "Mechanism of Shift in Potassium" read: "Shift from cells to serum with insulin therapy." It should have read: "Shift from serum to cells with insulin therapy."

Newer Insecticides and Scabicides

C. J. Lunsford, M.D., *Oakland*

SUMMARY

Experimental and clinical data show that taking thiamine chloride internally protects against flea bites. Application of DDT powder to the breeding places of fleas controls infestation.

Clinical data appear to show that the use of an ointment containing gamma isomer hexachlorocyclohexane is an effective and pleasant means of treating scabies.

EXPERIMENTS were conducted to determine the value of a number of substances purporting to repel or kill fleas when applied locally or given internally. The fleas used were cat fleas* obtained from dogs. They were collected in test tubes and fed three or four times a day on the forearms of human volunteers. Each tube contained six to 12 fleas. They fed without hesitation when applied to the skin of untreated humans.

LOCAL REPELLENTS

Oil of Citronella—Camphor: Several subjects applied oil of citronella and spirits of camphor to their forearms. The fleas were repelled and did not feed.

Pyrethrum: A thin sprinkling of insect powder containing 0.7 pyrethrum was dusted on the forearms of two subjects. The fleas were repelled after five minutes of feeding and were listless for 24 hours and would not feed; but they recovered. The forearms of two other subjects were sprinkled more heavily with the powder. The fleas were not observed to feed, but all died in 24 hours.

Army 6-12 (2 ethylhexane diol 1-3) was applied to three subjects. The fleas were repelled and most died within 24 hours.

DDT Powder (7.5 per cent DDT) was applied to two subjects. Fleas would not feed after five minutes and died in four hours.

Shaffer, Spencer and Blank[3] in October 1948 reported that 39 of 41 patients with flea or bedbug urticaria were clinically cured following a month's treatment using 5 per cent DDT in calamine lotion or powder. This was applied three times daily to the patient's skin. At the same time 5 per cent DDT in Flit® was sprayed about possible breeding places in rooms and basement. The authors reported no case of contact dermatitis from its local use.

Thus there is both experimental and clinical evidence of the efficiency of DDT when used against fleas. The author has had no personal clinical experience in its local use.

INTERNAL REPELLENTS

Quinine: Eight tubes of fleas were fed on four subjects given five grains of quinine sulfate three times a day for three days. At the end of 36 hours 90 per cent of the fleas were dead.

Thiamine Chloride: In July 1945 Eder[2] reported on the use of thiamine chloride given internally as a preventative of flea bites. He gave 10 mg. three times a day to infants, with double and quadruple that dose to older children and adults. He reported no failures.

Because of that report and communications from certain dermatologists in the San Francisco Bay area that that vitamin would protect not only humans but cats and dogs from flea bites, experiments with use of the substance were carried out.

One subject was given 100 mg. of thiamine chloride, intramuscularly. One-half hour later fleas fed. Six hours, 10 hours and 22 hours later fleas were repelled and would not feed on either the subject or on four other subjects who had not taken thiamine chloride. Two days later fleas fed on the original subject.

Four subjects were given 100 mg. of thiamine chloride intramuscularly at 11:00 a.m., 4:30 p.m. and 10:30 a.m. the next day. At 1:00 p.m. fleas were planted on all subjects and fed for five minutes, then quit feeding. At 8:00 a.m., 9:00 a.m. and 3:00 p.m. the next day the fleas would not feed. At the end of 48 hours most of the fleas were dead. The fleas that remained alive fed.

Seven test tubes of fleas were fed on three subjects given 100 mg. of thiamine chloride by mouth three times a day. At the end of six hours the fleas fed reluctantly. At subsequent plantings they fed for not more than five minutes and were inactive. At the end of three days most of them were dead.

This experiment indicates that at first fleas are repelled but later feed and die when planted on patients given thiamine chloride.

Fleas were fed on four individuals with a history of flea sensitivity. Reactions typical of flea bite developed. After three doses of 100 mg. of thiamine chloride had been given, fleas were again fed on the subjects. The subsequent effect was either a less severe reaction or none at all.

Presented as part of a Symposium on Progress in Dermatology before the Section on Dermatology and Syphilology at the 78th Annual Meeting of the California Medical Association, Los Angeles, May 8-11, 1949.

* Supplied by M. A. Stewart, Ph.D., of the Department of Parasitology, University of California, Berkeley.

The question arises as to whether this lowered reactivity was due to the desensitizing or the repellent action of thiamine chloride.

COMMENT

During the last two or three years the author has observed fewer cases of flea urticaria in the office than formerly. Also, M. A. Stewart, Ph.D., of the department of parasitology of the University of California at Berkeley has communicated that since the universal use and efficiency of DDT in the breeding places of fleas, it is difficult to obtain them for experimental purposes. That, plus the experimental and clinical data, makes it appear that flea infestation can be held to a minimum by the appropriate use of DDT.

SCABIES

Since the parasite causing scabies was described by Cosimo Bonano, Leghorn, Italy, in 1687 there had been no real improvement in treatment until the resurrection of benzyl benzoate about 10 years ago. Until that time sulfur in various forms had been used. It was efficient, but had the disadvantage of taking several days to administer, was messy and had a disagreeable odor, and produced contact dermatitis in a large percentage of cases.

When benzyl benzoate was reintroduced the author gave it a trial. The formula used contained about equal parts of benzyl benzoate, soft soap and alcohol. It is more pleasant to use than sulfur, is as efficient, does its work in 24 hours, and produces dermatitis in a much smaller percentage of cases than does sulfur. Some patients, particularly infants, complain of burning when it is applied. All in all, the author has found it to be greatly superior to sulfur in any form in the treatment of scabies.

In May 1948 Wooldridge[4] reported on the treatment of scabies with the gamma isomer of hexachlorocyclohexane. Seventy-two infected patients varying in age from eight weeks to 82 years were treated; 95 per cent were cured with a single application in a 24-hour period. Secondary infection had no effect on the results of treatment. Only one case of irritation was observed, and on patch testing this was found to be due to the perfume used in the base.

In October 1948 Cannon and McRae[1] reported comparable results using the same drug. An ointment containing the drug has been put on the market under the name of Kwell Ointment.® It contains 1 per cent of the active ingredient in a perfumed base. The author has used it on about a dozen patients. In no case has the treatment had to be repeated. No irritation has been observed in infants, children or adults. The author's impression is that it is superior in every sense to any other drug he has used in the treatment of scabies.

BEDBUGS

From the report of Shaffer, Spencer and Blank[3] it would seem that DDT is the drug to use against bedbug infestations.

MOSQUITOES

Eder's[2] use of thiamine chloride was based on its use by Shannon in the successful prevention of mosquito bites. It would seem, then, that thiamine chloride is the preparation to use if one is in a mosquito zone. The author has had no experience in its use. Another physician, however, in a personal communication said that when he used thiamine chloride because of fleas he found not only that it was effective against those insects but that mosquitoes no longer bit him.

LICE

The author has had occasion to treat only one patient for infestation with lice in several years. DDT dusting powder was promptly effective. The Army found DDT highly effective in the management of lice infestations.

3115 Webster Street.

REFERENCES

1. Cannon, A. B., and McRae, M. E.: Treatment of scabies, J.A.M.A., 138: 557-560, Oct. 23, 1948.

2. Eder, Howard L.: Fleabites, prevention and treatment with thiamine chloride, Arch. Pediatrics, 62:300, July 1945.

3. Shaffer, B., Spencer, M. C., and Blank, H.: Papular urticaria; its response with DDT and the role of insect bites in its etiology, J. Investigative Derm., 11:293, Oct. 1948.

4. Wooldridge, W. E.: The gamma isomer of hexachlorocyclohexane in the treatment of scabies, J. Investigative Derm., 10:363, May 1948.

Indications for Pulmonary Resection in Infants and Children

JOHN C. JONES, M.D., *Los Angeles*

SUMMARY

Improvements in anesthetic and surgical techniques, and the availability of antibiotic drugs have made pulmonary resection a safe procedure for even newborn and very ill infants when it is necessary for treatment of bronchiectasis, abscess of the lung, tumors, and congenital cysts, both infected and non-infected.

In a series of 34 infants and children upon whom lobectomy or pneumonectomy was done, all were cured of the disease which dictated the operation. There were no deaths.

THE usual indications for pulmonary resection in infants and children are now rather broad and include bronchiectasis, lung abscess, congenital cysts both infected and non-infected, and tumors. With the development of improved anesthetic and surgical techniques, these indications have been extended to include newborn infants. In addition, the employment of antibiotics has considerably reduced the mortality and morbidity of operation. What appears to be radical operation can now be carried out with little risk and no deformity.

The most common indications for resection of a lobe or lobes of the lungs are bronchiectasis and chronic abscess. Of 34 lung resections carried out at the Children's Hospital in the last six and one-half years, approximately 70 per cent were because of such lesions. Identified foreign bodies were recovered from the bronchi in only six of the 24 cases in which resection was carried out for bronchiectasis, but it is believed a number of other patients had disease caused by an unrecognized foreign body which had disintegrated or had been coughed up. Post-tonsillectomy and aspiration lung abscesses, chronic lung infections following acute infectious diseases and chronic pulmonary atelectasis were the factors in the remainder of the patients with suppurative lesions. Six pneumonectomies and 18 lobectomies were carried out in the treatment of these patients. Conservative treatment had not relieved them and progressive destructive lesions of the lung dictated pulmonary resection.

Congenital cysts of the lung were the second most common indication for pulmonary resection in infants and children. Nine patients (27 per cent of the series) were operated upon (eight lobectomies and one pneumonectomy) for these lesions. Five of the patients had non-infected tension or "balloon" cysts of the lung; in four cases the operation was lobectomy and in one it was pneumonectomy. The remaining four of the nine patients had infected cysts of the lung simulating lung abscesses. All of them were treated by lobectomy.

Among the most interesting pulmonary lesions in infants and children are congenital tension cysts, which may be overlooked for a long time if symptoms are absent or minimal. However, dyspnea, cyanosis and stridor may occur early in life, sometimes within the first few hours after birth, and in such circumstances roentgen study, which is the usual positive method of diagnosing these "balloon" cysts, is mandatory. The usual erroneous clinical diagnosis in patients with the symptoms mentioned is spontaneous pneumothorax, but the roentgen diagnostic features of these two lesions are quite distinct and need not be confused. In the author's experience, the incidence of congenital tension cyst of the lung is far more common than spontaneous pneumothorax in young infants and children, and since the treatment for one is quite different than for the other, accurate diagnosis is important. The treatment of pneumothorax is either expectant or by aspiration, depending upon the severity of the symptoms and the volume of pneumothorax. Inadvertent aspiration of a tension cyst of the lung, on the other hand, may be catastrophical because aspiration does not relieve the situation but usually creates a superimposed pneumothorax which is not tolerated by an infant already dyspneic because of a tension cyst. (See Figures 1 and 2.)

The exact cause of tension cysts of the lung is not known. The cysts may exist for years before they are accidentally found either at autopsy or by x-ray examination. The mechanism of the ballooning of a tension cyst is explained as a one-way valve action of a bronchus leading to the cyst which prevents the escape of air from the cyst. As soon as the cavity tension builds up to encroach on the volume of the remainder of the lung or when a shift of the mediastinum occurs, then dyspnea, cyanosis and respiratory stridor become evident. This may occur in the first few hours or days of life, as it did in four of the five patients in this series who had such cysts. One of the patients was dyspneic at birth and cyanosis and stridor were evident soon afterwards, but an erroneous diagnosis of diaphragmatic hernia was

---

Presented before the Section on Pediatrics at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

From the Department of Thoracic Surgery at the Children's Hospital, Los Angeles, and the School of Medicine of the University of Southern California.

made despite the presence of the right-sided intrathoracic lesion. In this instance emergency operation had to be done when the infant was three days old. The right lower lobe was resected and the remaining middle and upper lobes expanded to fill the hemithorax. Fourteen days after operation, the right hemithorax appeared as if no operation had been performed. Resection is indicated as an emergency measure in cases in which dyspnea, cyanosis and stridor are persistent and troublesome, and as an elective operation if the condition is obviously persistent even though symptoms are minimal. Usually the cysts are confined to one lobe, as was the case in all five of the patients in this series. Lobectomy was done in four of the patients, while pneumonectomy was necessary for the other because of failure

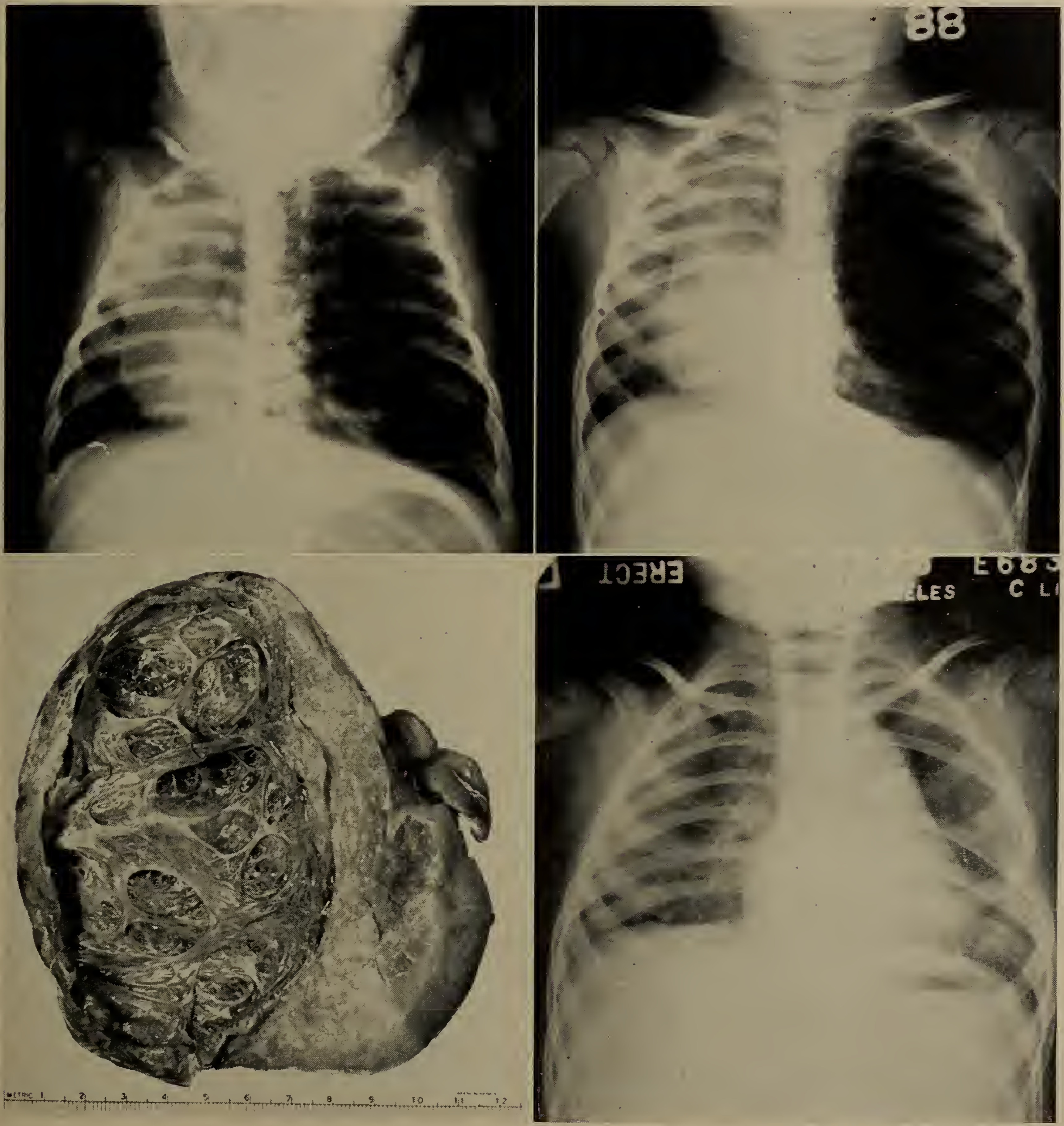


Figure 1.—*Upper left*—Chest roentgenogram (Oct. 9, 1944) of a three-month-old infant having dyspnea and occasional cyanotic spells due to a large tension cyst (congenital) in the left upper upper lobe. Note the pronounced shift of the mediastinum to the right and a complete atelectasis of the left lower lobe. *Upper right*—Roentgenogram of the same patient at the age of 19 months. She had failed to gain weight and develop normally and dyspnea had become progressively worse. Roentgenogram taken three weeks before lobectomy revealed the persistence of a large tension cyst of the left upper lobe. *Lower left*—Photograph of the bisected left upper lobe resected on March 4, 1946, revealed a large cyst lined by typical trabeculae. Adjacent to the cyst is the atelectatic lung tissue. *Lower right* — Postoperative roentgenogram (March 22, 1946) taken 18 days after left upper lobectomy reveals complete expansion of the remaining left lower lobe to fill the hemithorax and a shift of the mediastinum to its normal position.

of the remaining lobe to reexpand at the time of operation. The ages of the five patients were three days, two months, two and one-half months, nine months, and three years. All had uneventful convalescence from operation and at last report were well.

Infected congenital cysts of the lung simulating lung abscess occurred in four patients in the series. They had symptoms of pulmonary suppuration—wet cough with periodic bouts of fever and failure to gain weight. In roentgenograms infected cysts are similar to and frequently are mistaken for lung abscess, but a distinguishing feature is that the pneumonitis about the cavity is much less in the case of infected cyst than in abscess. Infected cysts of the lung are best treated by resection. The alternative of external surgical drainage is protracted and troublesome, and as the cavity is not obliterated by this procedure the patient is not cured. All four of the patients in this series who were treated by lobectomy for infected congenital cysts were well at last report. (See Figures 3 and 4.)

Primary lung tumors in infants and children are uncommon. Adenoma of the bronchus is by far the commonest variety of tumor occurring in children. Chondroma and hamartoma are relatively rare. These tumors cause the usual symptoms of bronchial obstruction—cough and wheeze—and when the degree of obstruction is great enough, eventually the symptoms of superimposed infection are added. All such tumors should be treated by resection of either a portion of the lobe or a lobe or even a lung, depending upon the extent and the location of the lesion.

The complications following pulmonary resection in the author's experience have been pleural effusion, empyema, esophageal fistula, laryngeal edema and pulmonary atelectasis. Pleural effusion is easily treated by needle aspiration. In the present series, empyema occurred in one patient before penicillin was obtainable. This patient was cured by rib resection and drainage. In another case, inadvertent injury to the esophagus during a difficult pneumonectomy resulted in esophagopleural fistula in spite of repair of the esophagus at the time of operation. Thoracotomy and gastrostomy resulted in a final cure in about three months. Laryngeal edema and stridor are not uncommon in young children following intratracheal anesthesia but in one case in this series it was severe enough to warrant tracheotomy. The patient recovered in two weeks following intubation. Pulmonary atelectasis

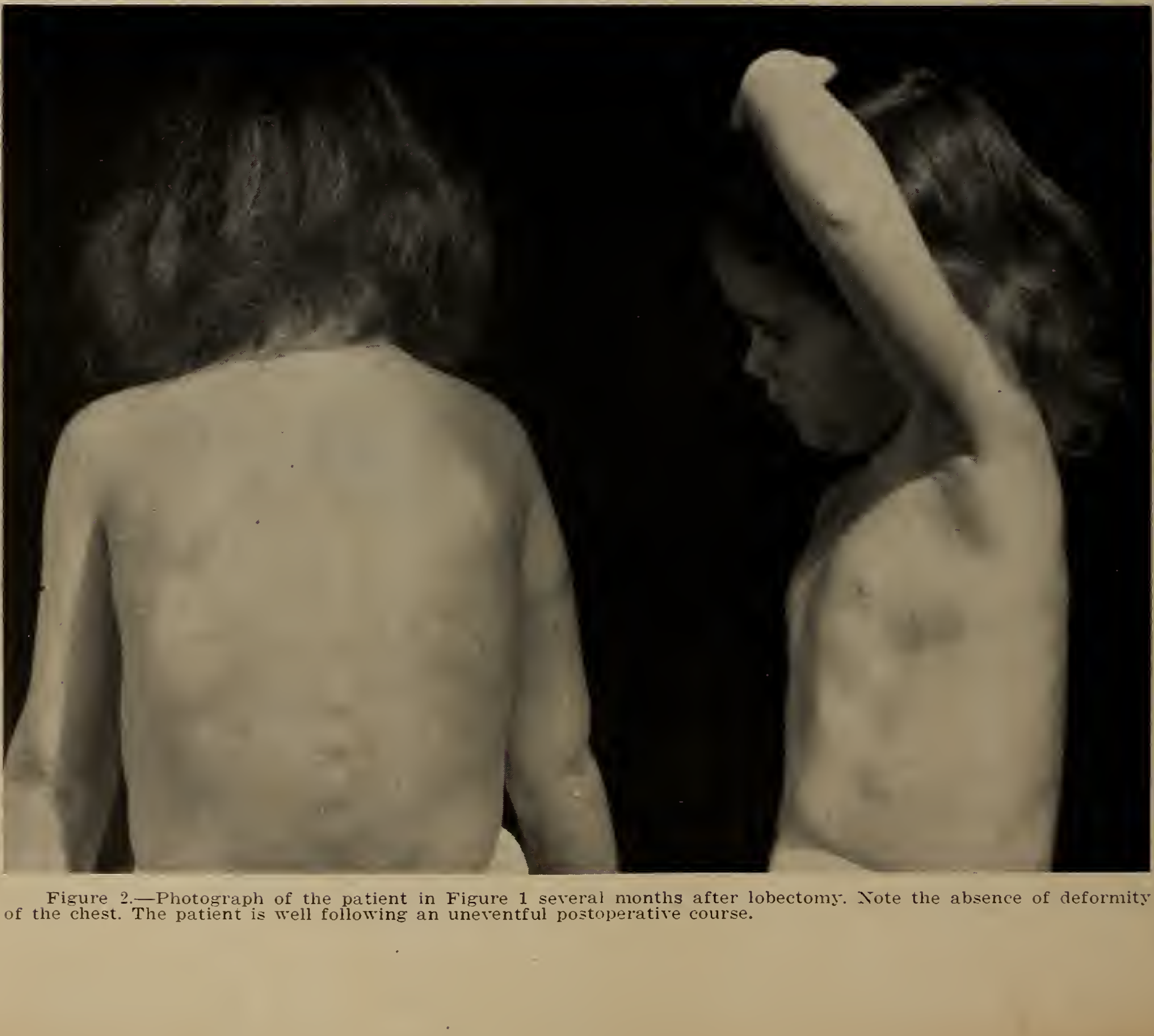


Figure 2.—Photograph of the patient in Figure 1 several months after lobectomy. Note the absence of deformity of the chest. The patient is well following an uneventful postoperative course.

following retention of secretions was transient in several patients and required bronchoscopy in two patients in order to institute good aeration of the atelectatic lobe.

All of the patients operated upon in this series were given ether-oxygen anesthesia by way of an intratracheal catheter. Lobectomy, pneumonectomy or partial segmental resection of the lobe was carried out by dissection and individual ligation technique. Drainage for 48 hours by intercostal tube was carried out in 25 per cent of the cases in which lobectomy was done; in the remainder there was no drainage at all.

The results of experience with 34 successive resections of the lung at the Children's Hospital are given in Table 1. The patients were all well at last report following surgical eradication of lesions by resection of the lung, lobe or segment of a lobe. There

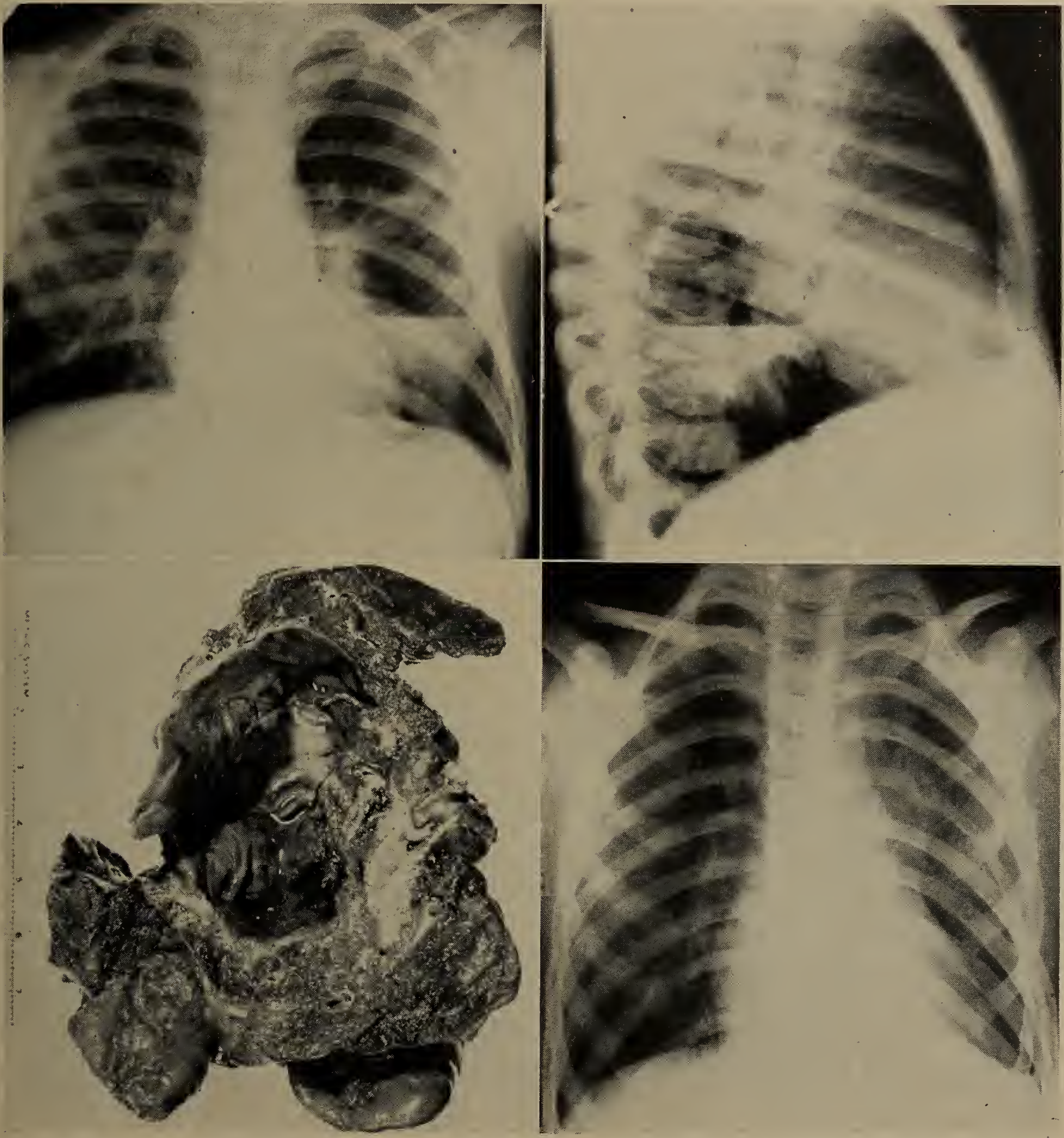


Figure 3.—*Upper left and right*—Roentgenograms of the chest (March 6, 1945) of a six-year-old boy who for three years had had a productive cough, periodic bouts of fever and had failed to develop normally. On two occasions tube drainage had been carried out by the insertion of a catheter into what had been misdiagnosed as an "empyema." These roentgenograms reveal a typical infected congenital cyst in the left lower lobe. Note the fluid level in the cavity and the absence of pneumonitis around the fairly thin walled cyst. *Lower left*—Photograph of left lower lobe resected March 7, 1945. The cyst cavity lining of bronchial epithelium had been replaced by chronic inflammatory tissue and its wall was surrounded by fibrous tissue scar, pneumonitis, emphysema and thickened bronchi. It was not feasible to resect only the cyst at operation. *Lower right*—Roentgenogram of the chest several months after left lower lobectomy reveals an expansion of the remaining upper lobe to fill the hemithorax and regeneration of the resected sixth rib.

TABLE 1.—*Pulmonary Resections, Nature of Disease, Type of Operation and Results*

	Lobectomy	Pneumonectomy	Cured and well
Bronchiectasis and lung abscess	13	5	18
Foreign body and bronchiectasis	5	1	6
Tension congenital cysts	4	1	5
Infected congenital cysts	4	....	4
Bronchial tumor	....	1	1
Total	26	8	34(100%)

were no deaths. The results indicate that pulmonary resection is a safe procedure under ideal conditions of expert anesthesia, sound surgical technique and the aid of the antibiotics.

Discussion by DONALD C. SHELBY, M.D., *Los Angeles*

Dr. Jones' paper again illustrates the remarkable improvements that have been made in pediatric surgery in the last few years.

Dr. Jones has well covered the indications for lobectomy in children, and has presented a remarkable series of 34 children who have had the necessary operations upon their respiratory tracts.

A few points should be emphasized. The child with persistent, unexplained cough is entitled to further diagnostic tests to rule out bronchiectasis, congenital lung cysts, lung abscesses, and congenital emphysema or over-distention of the lungs as seen in the newborn. A history to determine the ingestion or inhalation of foreign bodies should be recorded. An x-ray film of the chest showing no abnormality should not terminate further search in the respiratory tract for the cause of the cough.

A direct laryngoscopic examination might first be considered. The next important step is bronchoscopic examination, and at the same time a bronchogram should be made. All five lobes of the lung can be visualized at the one operation.

A second important point is that necessary chest operations should not be delayed because of age. As noted, a three-day-old infant in Dr. Jones' series stood the operation well when it was done by a well trained pediatric surgeon. Too many physicians have fixed ideas on the advisability of operations for infants. They frequently state that the operation should "wait until the baby has started to gain." Often immediate operation is the only treatment that will permit the infant to gain, and grow normally.

The zero mortality rate in this series speaks for the successful teamwork between the chest surgeon, the pediatric anesthetist and the pediatrician. A glowing tribute should be paid to the anesthetists who have now improved their techniques to such a degree that they may carry a child safely through long and tedious procedures upon the open chest. The time to do the operation is when the diagnosis is made.

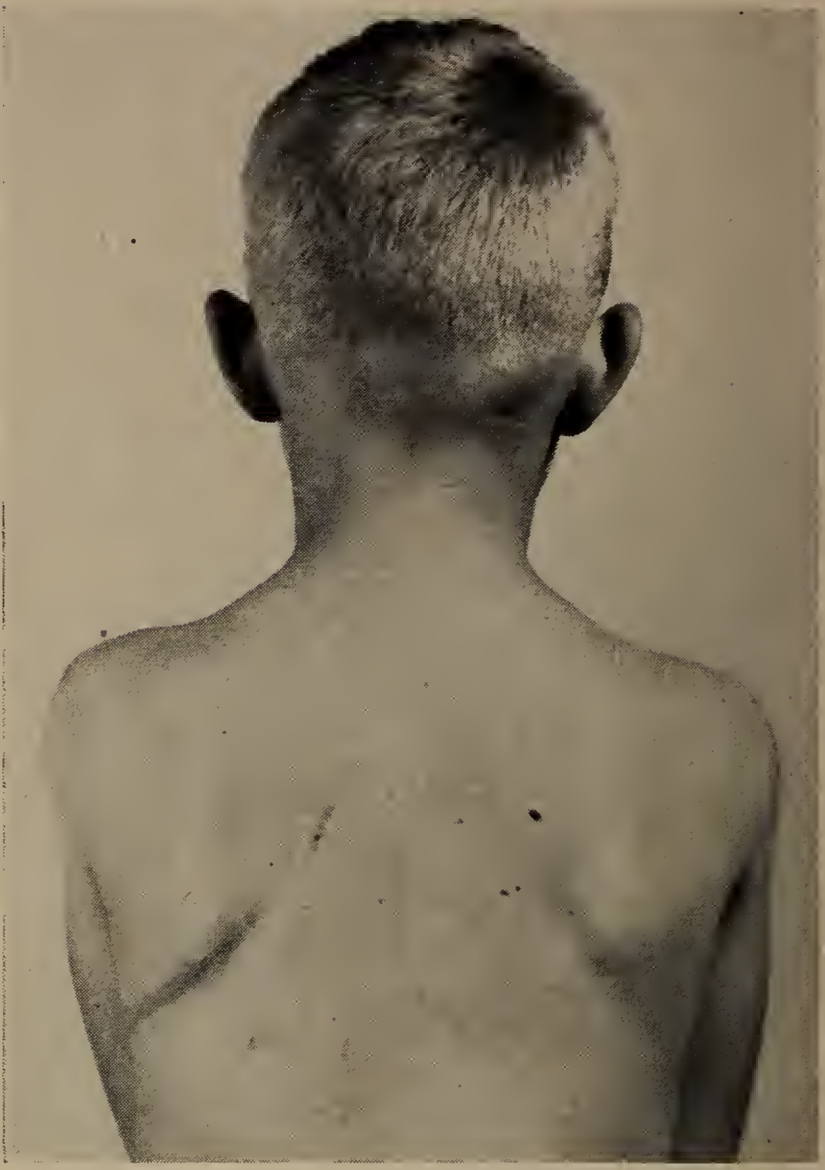


Figure 4.—Postoperative photograph of the patient shows a healed scar without deformity. The patient has remained well following an uneventful postlobectomy convalescence.

Another rare cause of severe cough may be the presence of persistent aortic arches, either anterior or posterior, which constrict the trachea or esophagus. The symptoms from such constriction simulate a typical asthmatic cough, with respiratory wheezes. Even epinephrine has been known at times to relieve that wheeze. Embryonic tracheal diverticulum cysts may give similar asthmatic symptoms. Observing the course of swallowed barium fluoroscopically may reveal esophageal deviations or constrictions.

Upon examining a child a few months after a successful lobectomy has been completed, the operative scar will be noted, but there will be no deformity of the chest. On auscultation, the breath sounds are usually normal and equal on both sides. An x-ray of the chest at that time will show the regenerating rib at the operation site, and completely expanded lungs filling the thoracic cage. So normal is the area that frequently the physician asks if the lobe really was removed at the time of operation.

The increasing use of the 70 mm. chest photofluorographic service will probably reveal many more cases of pulmonary disease that will be found amenable to surgical treatment.

Psychiatric Problems in Children

Part I of Two Parts

S. A. Szurek, M.D., *San Francisco*

IN preparing for this meeting* I have repeatedly asked myself the question, "What can I tell general practitioners about emotional, that is, psychiatric, problems of children which they do not already know?" Each time I mulled over the question, the same answer came, "Nothing!" This may or may not surprise you, but it is nevertheless true. In a very important sense, I cannot tell you anything from my special experience in child psychiatry which you do not already know from your own clinical experience. I can review with you—as I will in the face of this dilemma—more or less systematically those *concepts* of mental disorder in childhood which are more or less generally held and more or less generally accepted. I can, in other words, say something of our notions, or of our ideas of such syndromes of childhood as psychosis, neurosis and aggressive behavior disorder or psychopathy. I can delineate more or less concisely the characteristic symptoms or behavior of a child to which we — when we have to for various official purposes—give one of these diagnostic titles. This sort of discussion, I am sure, has some usefulness in refreshing your memories about the ideas you have heard and read in this field, and in giving you the feeling that there is some organized knowledge about these things. I can say something about what, at least I think, are some of the etiological factors in each of these syndromes and something about the more or less accepted methods of therapy of these conditions. This, too, may give you some notion of how we specialists struggle with these kinds of human problems. Perhaps some of you may even gain some encouragement to try to do something, or to do *more* of what you have already done, about such clinical situations in your practice.

Nevertheless, I am inclined to maintain that I cannot, in the brief time allotted, say very much, if anything, which will be useful to you, which you have not already experienced and which you have not already, in some sense, understood. In particular, I am dubious whether my talking to you will result in your being *better* able to do something about such illnesses and personality problems of children. Such doubt comes not only from what modesty I have about my competence and skill as a lecturer, but also and in a larger measure from the nature of the problem. I mean by this that therapy in psychiatry — particular psychotherapy, which I am inclined to think is the chief, if not the only, tool in child psychiatry—such therapy, I say, like any other specific skill in medicine is not generally learned merely by listening to someone else *talk* about it.

For this, practical work with patients *under trained supervision* is, I think, essential. Frankly, I think that if instead of these lectures we had discussion periods in which you participated actively, in which you could raise the questions about some of these problems with which you come here, in which each of you might share with the rest of us what success and what difficulties you had with such clinical problems in your practice, and so on, if we did this instead of your listening to these lectures, you might all leave with more gained. The method is gradually becoming a more generally accepted way of teaching such psychiatric skill as can be taught to groups.

Before going on to the more systematic discussion of psychiatric syndromes of childhood, we might return for a moment to the reasons for my pessimism about the utility of lectures in increasing the *clinical*, practical competence of the audience of such lectures. In the first place, it is my conviction that psychotherapy is a many-sided activity which involves not merely some technical knowledge and skill intellectually grasped, but the whole of one's own attitude about life. It involves one's own philosophy about not only what the goals of life are, but in particular also how these goals or ends of living are to be achieved. When I say philosophy, I do not mean merely some consciously and explicitly articulated explanation one can give to oneself or to others in words. I mean by philosophy a more or less thoroughly ingrained attitude which is implicit in one's *spontaneous* feelings towards one's own impulses, about one's social role, one's rights in relation to others. It is the *unthinking*, basic tendency about all aspects of living with others which is important in this kind of work. How one acts and feels towards oneself is what is finally tested by emotionally disturbed patients, and it is the nature of this self-regard of the physician which is the effective therapeutic influence.

My point in this connection is that all of us are variously affected by the world and what's happening in it. Our psychiatric patients, for good reasons in their early and current experience, are simply much more affected by the same general events and perhaps in a more deleterious direction. But to the extent that we, as physicians and as persons with variously fortunate past experience, are also in doubt, divided, more or less deeply in our convictions, beliefs and attitudes, we participate in those difficulties which our patients experience even more poignantly. To the extent that this is true of ourselves, we are to that extent less able to help our patients with *their* conflicts and doubts about themselves. And, by the same token, to the extent that we suffer from the same divisions in ourselves, in our own feelings, the less likely it is that such conflicts — which are often not clearly in our awareness — can be resolved by listening to someone talk about such things.

---

*This presentation is the first of two lectures in a course in psychiatry for the general practitioner, sponsored by the University of California Medical School, University Extension, presented at The Langley Porter Clinic February 1, 1949.

From the Department of Child Psychiatry, The Langley Porter Clinic, University of California Medical School, San Francisco.

Unlike the experience of dissecting a cadaver to learn anatomy, of doing experiments upon animals to learn physiology, of looking at gross and microscopic specimens to learn pathology, the learning of psychopathology requires another process. This is a process of learning about one's own internal, subjective state, of how it came to be that way in one's own life's experience. This self-scrutiny and self-examination are not easy and rarely, if ever, sufficiently successful alone without the help of another, a trained person. It is, in brief, learning about one's own personality which is the most direct way of learning how to understand others.

It is for this reason that medical psychology seems intangible, strange, far-fetched, and the reason why it is difficult to grasp. Its material is inside ourselves, perceptible not only to our external but also to our internal sense organs, and hence elusive. Under these circumstances many of us feel this is not capable of "objective" examination, and hence not a proper subject for science. There is much more one could say about all this, but perhaps what has been said will suffice to suggest why I am inclined not to consider lectures as the most effective means of learning about feelings—good feelings, or bad feelings—which are finally what trouble our psychiatric patients—adults or children.

Let us review, then, first, the more or less distinct categories or types of disorders of feelings, thinking and action seen among children. I say "more or less distinct categories" because, as you all know, there is really no nosological entity, such as any diagnostic title implies, which corresponds very exactly with the disorder of any actually living person. The function of nosological concepts or ideas is to help organize *our* thinking about clinical phenomena in patients, and one needs always to be clear that *our ideas* or impressions of disorder need to be tentatively retained and discarded when the facts are no longer usefully explained by them. In psychiatry, but particularly in child psychiatry, this is especially true —and confusing to the unitiated. With this admonition about the concepts of disorder in childhood, let us consider some of these.

I would like to begin with neurosis. Neurosis in childhood, as in any other period of life, means that the child suffers from anxiety and that this anxiety is expressed and/or avoided by certain kinds of behavior. This behavior may be action (or lack of it) of the child in relation to other persons or evidenced in his subjective state and physiology, or more commonly in both ways. I do not suppose it is necessary at this point in the course for me to dilate upon anxiety. Perhaps I need only say that anxiety is that state of a human organism which appears to the onlooker as an extreme state of fear. We say it is extreme because the immediate external situation either does not seem to justify so intense a reaction at all, or the reaction appears disproportionate to whatever possible danger might be in it. In other words, anxiety is a reaction—subjectively the most disagreeable and unpleasant of human experiences—which is excessive, usually apparently unadaptive, and obviously indicates the operation of something in addition to the apparent *situation* around the child in which it is manifested. This additional factor which is internal to the child we call *conflict.* There is much to be said about conflict for which we do not have time. Perhaps the simplest definition might be that conflict is a state of self-opposition, of being impelled to behave in at least two diametrically opposite ways *at the same time.* As a few examples, we might cite the following: To run away and to fight or attack; to react with angry defiance and with ingratiating submission; to insist upon or to demand what one wishes and to give in and give up one's desire, and so forth. When such opposing impulses are of almost, or of about, equal strength, the human organism either vacillates between the two types of behavior, or there results a tense state of more or less total inhibition of all overt behavior. In any case, subjectively one experiences at such times *anxiety,* and because of such a dynamic division in oneself, one is more or less disabled, impotent in the face of some situation, and such relative helplessness itself increases the anxiety. You will note, however, that the internal physiological and internal subjective or psychological state even, and especially, in the state of more or less overt paralysis of action, is never one of smooth quiescence, but of considerable storm and turmoil.

Perhaps this will suffice to define briefly such terms as conflict, anxiety and the general dynamic state we call neurosis. If this condition is severe and chronic, that is, of some duration, there will be evident certain kinds of distortion of behavior of the child which will be characteristic for him alone, for his age, intelligence, physical equipment, his social and familial situation, and particularly for his experience in life up to that point. These distortions of behavior we tend to call the *symptoms* of the neurosis.

I do not need to enlarge upon the large and complicated variety of such neurotic symptoms in childhood. All of you have seen them in your clinical practice, heard of them, I am sure, as characteristic of adult neuroses, and read of them as well. One might divide them very roughly into three great, but not therefore into any mutually exclusive, categories: (a) disturbances in physiology, (b) disturbances in the subjective or psychological state of feelings and thoughts, and (c) disorder of behavior in relation to other persons. I do not intend exhaustively to list the variety in each of these classes. A few examples from each will, I am sure, suffice to recall others you yourselves have seen clinically. Thus, under physiological disturbances all the systems and tissues of the body are capable of being affected. Gastrointestinal disorders from total loss of appetite as anorexia, finicky food habits, aversions or its opposite of bulimia and overeating, through nausea, vomiting, abdominal pain, to constipation or diarrhea and soiling, or a varying degree of failure to acquire toilet habits and sphincter control are among the commonest ills of children for which physicians are consulted. Skin disorders, respiratory difficulties, varying cardiac symptoms, genito-urinary troubles ranging from frequency and urgency to diurnal and nocturnal enuresis, headaches, as well as general weakness, are additional random examples which come to mind. Among the host of psychological symptoms, perhaps the commonest are various phobias, sleep disturbances with nightmares and terrors, but also inability to concentrate, with or without the appearance of obsessional thinking, and compulsive rituals. In the realm of interpersonal behavior perhaps the most frequently seen are varying degrees of avoidance of age-mates up to more or less complete withdrawal, as well as excessive submissiveness or ingratiating tactics with others.

To speak in this way of neurotic symptoms, even to illustrate them, however, is very unsatisfying to me. There is implied, in such a division of symptoms into categories, a criterion of classification which is invalid. One cannot even conceptually divide the human being into a physiological machine, a private psychological microcosm and a more public personality as we have just done without losing the essence of the unity which is the *person*, young or old. I mean quite simply that if we speak and think of children or adults in more or less impersonal, generalized terms, there is considerable likelihood—I was about to say *danger*—of losing the sense of a unique individual human being, with all the complexity of his characteristics, of his feelings, of his hopes, ambitions, desires and fears, of his particular relations with his family, with his friends and enemies at a given time in his life. In other words, all those personal qualities and facts of his current life situation which somehow "make sense" to those of us who are acquainted enough with these things about him, are apt either to be disregarded or lost in the generalized and theoretical constructions of such divisions of neurotic symptoms as I have just outlined. The danger of this loss of the sense of the individual, unique person lies in the failure of adequate diagnosis of his disorder and hence of inadequate therapy. But more about this later. And yet, unless we speak of a specific patient and all we may know or learn about him, some such generalizations are necessary in discussions such as this.

Hence, we may say, in general, that the neurotic child is apt to be the over-conforming, the over-obedient, the over-conscientious child. He is the child about whom it might be said that he is too "good" to be true, so "good" it hurts. He is the child who is a model, a mother's boy—or father's girl—perhaps extremely considerate (even over-considerate) of the feelings of others, and eager to excel in school and to please especially the important adults. He may be over-meticulous, orderly, punctual, over-polite in most respects. He may worry excessively about lessons, show perfectionistic tendencies in this direction and over-react to minor failures, errors, or—and especially—to the slights of people important to him with a mixture of depression or "hurt" feelings.

The neurotic child may—typically—rarely show, or even be able to feel, anger and frank resentment at such thwartings. Instead of some fight at any aggressiveness of his less inhibited playmates towards him, his tendency is towards flight, tears, and seeking of protection from adults. These tendencies infuriate his contemporaries even more who are then not only tempted to use him all the more as the butt of their envious rage at his "goodness," but also as one way to get back at the adults who protect him. Such experiences tend not only to drive the fearful, intimidated, neurotic child into avoidances of his possible playmates—into some degree of isolation and withdrawal, in other words—but also to even greater self-contempt and to still further lowering of his self-esteem and a more severe sense of estrangement. This increases the tendency to further vicious circles: Either to attempts at ingratiation, at buying some degree of tolerance from the bullying playmates by submission which increases their tendency to exploit and bully him more—or to efforts defensively to maintain a false attitude of indifference to their dislike which appears to them as an air of superiority which also keeps him isolated, unhappy and lonely.

When such events pile up in his life up to and beyond the limit of his tolerance, we see an eruption of a neurotic illness, of a crisis which expresses itself in poor sleep, nightmares, failure of appetite, fears of going out and to school, inability to concentrate on his lessons and hence failure to learn, and the innumerable other combinations of disturbances in total functioning. His school performance and his weight may decline and the pediatrician or the family's general practitioner may be consulted for his pallor, listlessness and general health. Although the physician may find hypertrophied tonsils, slight anemia or some degree of malnutrition, he may also be puzzled because these physical findings may not be present or only in slight degree, and what he may hear most about from an anxious and over-solicitous mother are the somatic complaints and less or nothing about the rest of his other difficulties in living—unless he inquires about them.

Such, briefly, for the moment, is the general picture of neurotic illness in a child.

Before discussing what is in some respects the opposite clinical category of aggressive behavior disorder, let us consider now what I think is the extreme form of the neurotic illness, namely, the psychosis.

I must preface this brief outline of psychotic illness in children with a word about my own growing conviction—a bias, some might prefer to call it —as to its nature and etiology. I mean that, unlike some of my colleagues in the field, I am, on the basis of increasing, recent clinical experience, coming to the notion that these severe and often very chronic and quite frequently prognostically rather hopeless illnesses are the outcome of essentially the same, but more intense, factors operating earlier in the life of the child as those resulting in the milder neurotic and psychopathic disorders. In other words, I am inclined to consider and treat the psychoses of children as psychologically, rather than organically, determined. To put it in still another way, the psychotic way of life of a child is the outcome of, and an adaptation to, interpersonal stress, the difficulties experienced in living with the emotionally significant others around him. To place the emphasis etiologically upon the personal factors in the psychoses thus, is not to deny that impersonal factors (such as a congenital or acquired disease or defect of the brain or other parts of the body) may play a role. Such diseases or defects which handicap the child in comparison to his siblings or playmates and which decrease the satisfactions of his parents in his growth, appearance, etc., and increase their burden of his care, obviously are highly relevant factors. My point is, however, that there are many children with severe handicaps from such diseases *without* psychotic disorder in total living, and many psychotically disordered children in whom we find no identifiable evidence of such disease or defect. Finally, another and a critical bit of evidence is the fact that there is increasing data that psychotically ill children can improve if treated psychotherapeutically with sufficient skill, intensiveness and persistence.

I cannot here offer the details of the clinical evidence for this view of the genesis and nature of the psychotic illness. It is still such that the skeptical and the impatiently critical clinician will not be impressed. I must say, too, that there are many psychiatrists with considerable clinical experience with children who conceive and treat the psychoses of children as some rather obscure diseases of the encephalon and apparently without much hesitation use electric shock or insulin coma as treatment. There are others who make elaborate statistical studies to establish a genetic, hereditary etiology of the psychoses. Although you may conclude from such data as are recorded to support this contrary view that the whole question is far from being decided, I hope you will also give some consideration to the possibility which I advance here, namely, that the psychosis is essentially a more *neurotic neurosis* than the neurosis. Quite simply, I mean that the more severe, the more strange and often the more chronic disorder may be considered as one which is *qualitatively* different because of greater quantitative differences from what we so often defensively speak of as the *normal* personality development.

After this brief excursion into general conceptions of etiology, we may now outline, also briefly, the clinical picture of the psychosis of childhood. To begin with, one must say that, strictly speaking, the so-called mood or affective disorders, the manic-depressive psychoses, are rarely, if ever, encountered in childhood. Depressive reactions so severe as to lead to suicide are infrequent, at least, before puberty. The wide variety of strange and queer adjustments to life seen among prepubescent children are all, or most of them, likely to be called the schizophrenias of childhood. Disturbances in personality development so severe as to earn from the psychiatrist the diagnostic title of schizophrenia occur, or at least may be so classified, from the age of two years, and I know of no sex differential as to incidence. I am also unaware of any significant differences as to the ordinal position of the schizophrenic child. I mean that the child whose mode of living we may call schizophrenic may be the only child, the oldest, the youngest, somewhere in the middle of a series of siblings, or one of twins.

Because the particular schizophrenic child may show a bewildering concatenation of symptoms, let me discuss the general form of the disorder. One could describe the core of the schizophrenic disorder in several ways. One might say there is extreme failure in integration of the self; that self-opposition is so severe in respect to so many biological tendencies that there is little harmonious organization into a more or less stably coherent "I" or ego. One might say that the child is so extremely distrustful of himself and others, so extremely sensitive to rebuff from others, that he persistently prefers his own autistic world of reverie and bodily sensations rather than to expose, very often, his precarious self-esteem to the bruising inevitable in fuller living with others. One might say also that his self-hatred and hatred for others is so extreme and so dangerous that it necessitates not only constant efforts at magical control and disguise, but also estrangement and withdrawal from the world of living reality of others' probably retaliatory feelings. The wishes and desires of others—even if these coincide with one's own or are for one's own benefit—appear so autocratic or so smothering that blind and relentless, often gleefully self-destructive, opposition to them is not only imperative, but at the same time a unifying opportunity to assert oneself powerfully.

One could say all of these things and be partially correct in each of the statements. One can approach a more complete description of the core of what

Harry Stack Sullivan calls "the schizophrenic way of life"[5] by making all of these statements at the same time. So much depends upon one's position as a post of observation of what goes on: Whether one is, so to speak, on the sidelines watching the child and other persons with him; or whether one has penetrated as a therapist *into* the child's own subjective state *looking out* at the world of other persons around one or *looking in* to the welter of contradictory feelings and impulses within oneself.

In any case, in more ordinary parlance, the clinician sees the schizophrenic child as one who appears withdrawn, isolated, apparently indifferent — with flattened affect, as the textbooks say—to what goes on around him. At the same time, there are evidences of extreme, curiously incongruous and sometimes sudden phobias: Of a wheel on the wall of the dining room that has been hanging there many days; of the melody from the phonograph which has previously apparently been a source of delight and pleasure; of a phrase such as "too full" from the lips of another child in the dining room who comments about having eaten too much. There appear sudden, explosive, apparently unmotivated rages with flinging of chinaware on the floor, of a cat against the wall, killing it; kicking or striking a younger child or sitting on his prostrate body and pounding his head against the floor, or innumerable other violent eruptions of hostile aggression with cold, gleeful laughter at the results and just as sudden withdrawal into impenetrable gloomy, sullen speechlessness or queer posturing and whispering.

The clinician also sees without surprise pronounced disturbances in the most human form of communication with others—speech. There may be complete mutism which often raises doubts as to the inborn intelligence or the hearing of the child. There may be fragmentary speech, often with misuse or no use of the personal pronouns, and with peculiar inversions of word order. Speech may be in addition rather stilted or parrot-like as if devoid of emotional tone or interest. There may be peculiar intonations, jargon speech, neologistic tendencies or repetitious questionings which are either incongruous in a given situation or more or less completely incomprehensible. The schizophrenic child may be verbally unresponsive all day but suddenly and lustily sing in the night, waking the family. He may be seen whispering or talking to himself, voicing both the temptations to amoral behavior and his own severe admonition and condemnation of himself.

The frequency of sense falsifications, of auditory or visual hallucinatory experiences, is not great in my experience. However, grossly careless and amoral or what is technically called "regressive" behavior with respect to bodily functions and habits is quite frequent. Thus, in addition to bizarre and intense food preferences and aversions, eating may be extremely messy and sloppy. Even more striking, soiling, smearing with feces, open defecations and urination everywhere except in the toilet, often occurs alternating with gleeful exhibitionism of the perineum or breasts, and genital or anal masturbation. The genitals or breasts of others may be the objects of sudden apparently unprovoked and coldly malicious attacks. Finally, the most striking characteristic is the almost impenetrable indifference to other children, and the extreme difficulty in establishing any very durable or very intense emotional tie to any but the most patiently sensitive but self-respecting, adult who would be the child's therapist. The outcome, as I mentioned previously, is all too frequently a hebephrenic type of deteriorated living, after puberty is established, in a mental hospital for the remainder of the patient's life.

This much must suffice for a very sketchy picture of the psychotic degree of illness in childhood. There remains the third and last nosologically identifiable group of psychiatric disorders of childhood, the aggressive behavior disorder which in its most severe form or during adolescence is also called the psychopathic personality disorder or incorrigible delinquency.

I have already said that this type of disturbance in personality development is in many respects the opposite of the neurotic disorder. In place of the fearful, rigidly conforming tendencies of the neurotic, we find the reverse — an extremely defiant, persistently egocentric impulsiveness to any action which gratifies the whim of the moment often in spite of any consequences to self. Even in the preschool age such a child is the bully of the playground, ruthlessly exploiting the younger and the weaker siblings or other children. Parents complain of the difficulty in controlling his rages, of his tendency to wander off or even run away from the home. In school—when he attends—he is the bane of the teacher's existence with his open or surreptitious disruptions of classroom routine, with his lack of interest in learning and his leadership in rebellions. His frequent truancies from school, although secretly, perhaps, a relief to his teacher, become a persistent problem to both the school attendance officer and to juvenile court probation officers as he extends the theater of his operations to other people and property of the community. Petty larceny or even burglary or forgery are the more frequent misdemeanors of the boy, while sexual delinquencies even with adults are the more commonly registered complaints against the girl. Failure of probationary trials at continuing to live in the home or elsewhere in the community after repeated appearance before the juvenile court judge leads too often to longer periods of internment in a reformatory or a state training school, release from which may be followed by no essential change in attitudes and behavior during the later adolescence or adult life.

So sweeping and rapid a characterization of this general type of disorder is more useful for identifying the clinical problem here than for understanding the particular, individual child whose inability to restrain or control his impulsiveness may finally bring him before a doctor, whether a psychiatrist or not. The doctor may be surprised (after the story he hears about the child from the adults who bring him), to find often that the child is alert, spontaneous, even likeable in his engaging assertiveness. The child may even be rather frank about some of his behavior although quite apt either to lay the blame upon his teacher, his siblings or other grumpy adults, or he may—depending in part upon the tone and attitude of the questioning doctor—simply deny any knowledge of the reasons for his actions. If the doctor continues his acquaintance and contact with such a child, however, or is a trained observer, he will generally find under this first, apparently amiable and friendly surface a deep distrust that anyone really cares what he feels. The child most often indirectly and unwittingly, but at times quite clearly, reveals that he has felt cheated of the essential warmth of affection, and that he has experienced perhaps frequent, and even quite brutal punishment, but inadequate or inconsistent firmness. Hence, if one learns one cannot rely on adult steadiness to provide all those experiences which add up to a sense of belonging to a particular family group with definite rights, then one relies on opportunities and one's own skill for obtaining self-gratifications. Punishments for transgressions against obligations others wish to impose upon one, without adequate reward of deep approval and affection, are simply part of the necessary price of living and to be circumvented or avoided by any means at hand. Hence, punishments are other obstacles to getting what one wants; they are further evidence that no one cares and therefore reenforce the already deep sense of injustice. One is simply hardened into even more stolid and suspicious indifference by them; one tries next time to be more ingenious, if possible, in evading them and from the point of view of those to whom one's behavior is a headache, one learns nothing from the penalty and the strictness, although one may even promise to act differently in the future.

All this is not to say that some of these children, especially those from relatively stable homes, show no guilt or no evidence of some tendency to self-restraint. Even some of those with less fortunate familial circumstances manifest what is at the moment obviously sincere regret and remorse. When, however, the next time some disappointment at the hands of the important but often unnoticing adult occurs, the impulsiveness frequently proves to be stronger than whatever self-restraining tendency they may have integrated. The discouragement and impatience of the adults around the child after such an episode serves then often to deepen his own discouragement with himself although pride may permit nothing but sullen, defensive defiance to appear on the surface, and this evokes an even more hopeless impotent fury in the adult who feels he cannot reach the child or understand him.

If some of the child's impulsiveness, usually provoked in some subtle way which does not appear in the report, expresses itself in some blindly revengeful attack upon a person, then the doctor is asked or asks himself whether or not there is some encephalitic or perhaps epileptic disorder. The electroencephalogram is then sometimes read as showing a generalized cerebral dysrhythmia which offers some room for clinical interpretation of possible epileptic equivalent. If the child learns something of this either directly or from the hesitant attitude of the doctor, or from other adults thereafter, his impulsiveness is apt to be increased because there seems to be an additional reason why one cannot help what one does, now almost with medical sanction.

Such, then, are some of the general characteristics of this more or less identifiable syndrome of aggressive behavior disorder. There are other and quite individual tendencies which may be unique to a given child, but however variable in degree, the common difficulty is in living more or less peacefully with authority, within the more or less accepted mores, customs and standards of behavior. The psychiatric textbooks speak of the psychopathic personality in various terms such as "moral imbecile," "constitutional psychopathic inferior," emphasizing that although intelligence may be, and often is, average or above — sufficient, in other words, for the patient to be able to say verbally what is right or wrong—there is a peculiar and persistent inability to learn from even bitter experience. There is in such discussions also considerable emphasis upon the emotional immaturity of such a person, upon his failure to develop the capacity to postpone gratification for longer term goals in living. Essentially what is meant here is the person's varying degree of failure to identify himself with whatever ideals of community living are prevalent for the common welfare of himself and the others with whom and through whom he can obtain his satisfactions. Again, the notion that this disorder is the expression of some cerebral or other constitutional, that is, genetically transmitted defect of somatic equipment, is frequently encountered in such treatises on this subject. And once more I must raise doubts regarding such pessimism about etiology and prognosis. Although therapeutic results as regards very basic and durable modifications of such personality organizations in many instances are certainly extremely difficult to achieve, and prognosis therefore is certainly always guarded, I think nevertheless, that in every instance I have been able to study sufficiently closely there have been always adequate conditions in the postnatal, interpersonal experience to account for our failure to integrate such a person into our society's way of living.

This is Part I of an article in two parts. Part II, with a table of references, will appear in a succeeding issue.

Cholangiography Following Common Duct Drainage

Clarence E. Rees, M.D., *San Diego*

SUMMARY

In a series of 197 patients with extrahepatic biliary disease, 65 who had symptoms that met certain established criteria were operated upon to explore the common bile duct for stones. Stones or debris were found in 34 cases.

Certain phases of the procedure used are being reevaluated.

Because of unsatisfactory results with immediate cholangiograms, they were made only in selected cases in which the anticipated advantages outweighed the known disadvantages. Delayed cholangiography (10 or 12 days postoperatively) is considered a "must," however, for determination of the presence of remaining stones. If residual stones are shown, they are removed as soon as possible.

HAVE all the stones been removed from the common and hepatic ducts? This question always arises in cases in which stones are found in the common duct and it is not always answerable at the time of operation. The following is a report of 65 cases of common duct exploration in a series of 197 cases of extrahepatic biliary disease observed in a four-year period.

The common duct was opened in all cases in which any of the following conditions were present: (1) a history of colic and jaundice, (2) cholecystic disease with clinical jaundice or elevation of the icteric index, (3) jaundice not attributable to pancreatic carcinoma, and (4) recurring attacks of pancreatitis. It was opened also in cases in which there was no jaundice but in which (1) the relation of the diameter of the cystic duct to the size of the stones in the gallbladder was compatible with the passage of stones into the common duct, (2) the common duct was dilated, or (3) the common duct was thickened. In many of these cases stones were not found but the number in which they were found, even in the absence of indicating symptoms, was considerable.

PROCEDURE

The author does not needle the common duct for determination of the character of the bile or for injection of dye for cholangiography unless it is intended to open and drain the duct. There is danger of seepage of bile through the needle hole unless the duct is decompressed by drainage. In two such cases extravasation of bile into the peritoneal cavity resulted in bile peritonitis even though drainage of the abdomen was instituted at the time of closure of the abdominal wall. Both of the patients were very ill and one almost died.

When the common duct is opened, the procedure followed by the author is as follows:

1. The ducts are first explored with a small scoop to determine the possibility of removing stones and to palpate the ducts along the shafts.

2. If stones are palpated by the scoop or finger and cannot be removed, forceps are tried.

3. If forceps are not successful, an angled, open-ended glass tube, attached to a suction machine, is inserted and each duct is aspirated under low pressure. These tubes are of different sizes and angles so that they may be passed into the hepatic ducts as well as the common duct. This maneuver provides an excellent means of removing fragments and small stones.

4. A probe is passed through the ampulla into the duodenum. If the duct is dilated, an attempt to dilate the ampulla with dilators is made. The advisability of such dilatation of the ampulla is being questioned by many surgeons and currently by the author because (1) it is a blind procedure, (2) the duct is thin and has no muscular coat until it enters the wall of the duodenum where the sphincter is formed, (3) if the common duct joins the pancreatic duct, the course is not direct, and (4) the duct is often angled. As a result of these factors any resistance encountered by the probe may cause the probe, if forced, to (1) pass into the duodenum through the normal channel, (2) form a false passage into the duodenum above the sphincter, or (3) pass into the retroperitoneal space. The last possibility can constitute a serious complication particularly if a retroperitoneal extravasation of pancreatic fluid occurs (and it has been reported to have occurred). In view of these disadvantages of probing and dilating the distal end of the common duct, the author is at present reevaluating this procedure.

5. If a stone is located that cannot be removed through the original incision, the common duct is exposed posteriorly and incised over the stone, if possible. If on exposure the stone is not accessible, the duodenum is opened opposite the ampulla and the stone is removed through the duodenum.

6. Flushing of the ducts as a procedure for removing stones has not been particularly satisfactory in the author's experience, although it is a satisfactory method of removing clots and debris.

7. Finally, a T-tube is placed in the common duct and the duct closed tightly around it. Before insert-

---

From the Surgical Section of the Rees-Stealy Clinic.

Presented before the Section on General Surgery at the 78th Annual Meeting of the California Medical Association, Los Angeles, May 8-11, 1949.

ing the T-tube in the duct, the top of the T is split in order to remove, if present, the partial diaphragm at the point where the two elements join; if it is not removed, the diameter of the lumen is greatly diminished.

IMMEDIATE CHOLANGIOGRAMS

Immediate cholangiograms are not made routinely because they are not always satisfactory. Unsatisfactory results may be caused by (1) long exposure of low voltage portable x-ray equipment, (2) the inability of the anesthetized patient to control respiratory movement, and (3) the presence of clots and air in the ducts, incidental to manipulation, which results in misleading interpretation. The additional time required for this procedure is a disadvantage also, especially in the bad-risk patient. However, immediate cholangiograms do serve a purpose in selected cases. Preparation for immediate cholangiography is always made by placing a cassette containing an unexposed plate under the patient. In two cases in the series here reported upon, stones were found by this means and removed at the original operation.

Injection of the gallbladder at the time of operation for the purpose of visualization of the ducts, as recently advocated by Hicken, Coray, and Franz,[1] has not been tried by the author. This procedure seems to merit consideration.

DELAYED CHOLANGIOGRAMS

A delayed cholangiogram is a "must" in every case in which the duct has been explored and should be made before the T-tube is removed. This cholangiogram is taken 10 to 12 days postoperatively. Thirty minutes after the administration of 0.011 gm. (one-sixth of a grain) of morphine sulfate, the patient is taken to the x-ray department where, after aspiration of the T-tube and ducts, an opaque medium (Diodrast®) is injected through the tube and anteroposterior and lateral position x-ray exposures are made. If the ducts are not well outlined or if there is indication of a remaining stone, this examination is repeated the following day. If a residual stone is found, it is removed as soon as the patient can be convinced of the necessity for it. By this method residual stones were found in four patients. In three of these, the stones were removed before the patients left the hospital.

OBSERVATIONS

In the series of 197 cases of extrahepatic biliary disease, the common duct was opened in 65 cases (35.04 per cent). Stones or debris were found in 34 cases (51 per cent).

Cholangiograms were made in 60 cases and repeated in eight.

A history of jaundice was noted in 26 of the 65 cases and in 16 of these stones were found.

The icteric index was above 10 at the time of operation in 27 cases. In 14 of these and in two of the four in which the icteric index was below 10, stones were found. In 34 cases the icteric index was not determined.

In nine cases in which stones were found, there were both a history of jaundice and an icteric index above 10. In 23 cases there was either a history of jaundice or elevation of icteric index at the time of operation. In 11 cases there was neither a history of jaundice nor elevation of the icteric index.

There was one death (1.6 per cent) in the 65 cases in which the common duct was opened. In that case the patient had carcinoma of the pancreas. There were two deaths (1.02 per cent) for the series of 197 cases of extrahepatic biliary disease, including the patient who had carcinoma of the pancreas.

2001 Fourth Avenue.

REFERENCE

1. Hicken, N. F., Coray, Q. B., and Franz, B.: Anatomic variations of the extrahepatic biliary system as seen by cholangiographic studies, S.G.O., 88:577-585, April 1949.

Early Diagnosis of Strangulation Obstruction of the Small Intestine

Harold P. Totten, M.D., *Inglewood*

SUMMARY

Early recognition of strangulation obstruction of the small intestine is important in order that surgical relief may be undertaken before the bowel has been irreversibly damaged or the condition of the patient has so deteriorated as to make immediate operation unreasonably hazardous.

In the presence of other symptoms, an operative scar, particularly on the lower abdomen, should alert the examining physician to the possibility of strangulation obstruction. (In a series of 100 cases, the greatest single cause of strangulation was adhesive bands subsequent to abdominal operation.)

Other hallmarks of aid in diagnosis and in distinguishing early from advanced strangulation are discussed.

X-ray evidence varies in accord with the rapidity of development and the stage of strangulation.

Abdominal puncture may be utilized as a means of diagnosis with little risk.

During the past two decades or more, the mortality rate of intestinal obstruction has been greatly reduced. This has been due in large measure to a recognition of the pathologic physiology of small bowel obstruction, which in turn has resulted in adequate pre- and postoperative replacement therapy and the use of the indwelling tube for intestinal decompression, as introduced by Wangensteen and subsequently modified by others. Despite these advances, the mortality rate for strangulation obstruction has remained high.

It is generally recognized that the most important factor in management is early recognition, so that surgical relief may be undertaken before irreversible damage to the bowel has occurred, and before irreversible shock due to loss of circulating blood volume has taken place. It is further recognized that early differentiation between simple and strangulation obstruction may at times be difficult.

It is the purpose of this presentation to evaluate the symptoms and signs which are present in small bowel strangulation, with special reference to early diagnosis.

During the past five years, repeated clinical observations have impressed upon the author the diagnostic value of certain signs which will be discussed.

In addition, the pertinent data obtained from a study of 100 consecutive cases from the Los Angeles County General Hospital, Unit I, from 1942 to 1948, will be presented.

In order to emphasize the specific diagnostic problem, obvious causes of strangulation obstruction such as the various types of external hernia will be excluded from consideration, as will intussusception and mesenteric vascular occlusion, in which the clinical manifestations are different.

A study by Baumgartner of over 1,000 cases of all types of acute intestinal obstruction from this institution has shown the incidence of strangulation obstruction of the small intestine, as limited in this discussion, to be approximately 5.5 per cent.

A high index of suspicion (which at present apparently does not exist) on the part of the clinician would go far to aid early diagnosis. The administration of an opiate or cathartic (which is done in many cases) is to be deplored and indicates that the patient is not the only one at fault for tardy operation.

It is significant that in this series of 100 cases, only 5 per cent of the patients were operated upon within 12 hours of onset of symptoms, and only 23 per cent within the first 24 hours.

The most important observation concerning the cause of strangulation in this series was the high incidence (59 per cent) of cases in which strangulation resulted from adhesive bands, usually a single band subsequent to abdominal operation, particularly after operations for pelvic disease or complicated appendicitis. The presence of an operative scar, especially of the lower abdomen, should alert the examining physician to the possibility of strangulation obstruction.

On the other hand, in approximately one-third of cases there is nothing to suggest an obvious etiologic factor.

The following causes of strangulation are given in order of frequency, as they occurred in this series:

1. Adhesive band, postoperative.
2. Volvulus because of mesenteric abnormality.
3. Adhesions due to an intraperitoneal inflammatory process.
4. Volvulus without apparent cause.
5. Volvulus secondary to tumors.
6. Volvulus secondary to incarcerated external hernias.

Presented as part of a Symposium on Diseases of the Gastrointestinal Tract before a Joint Meeting of the Sections on General Medicine, General Surgery, General Practice, and Radiology at the 78th Annual Meeting of the California Medical Association; Los Angeles, May 8-11, 1949.

7. Miscellaneous causes in which strangulation was incident to the following: Paraduodenal hernia, omental defect, Meckel's diverticulum, volvulus of sigmoid, mesenteric defect, and strangulated loop beneath reconstructed pelvic floor following abdominoperineal resection (aperture created by inflamed epiploic appendage, and foreign body — an open hemostat).

SYMPTOMS AND PHYSICAL FINDINGS

Pain.

Pain in simple obstruction is characteristically intermittent, coincident with peristaltic rushes, colicky in nature, begins moderately, increases in intensity, and ceases rather abruptly with a definite interval free of discomfort.

Suggestive of strangulation is sudden onset, which in the majority of cases is severe. Gradual onset was recorded in only 6 per cent in this series. The pain was localized or maximum intensity was found in one area in 83 per cent. Not infrequently, the maximum intensity of pain was referred to the region of the operative scar or palpable mass. Characteristic of strangulation is continuous pain, more specifically continuous pain with intermittent exacerbation. Back pain, mentioned frequently in the literature, occurred in 15 per cent of cases. Flank pain was observed in 6 per cent.

Position or Attitude of Relief.

The patient with an intraperitoneal inflammatory lesion prefers to remain quiet. Motion increases pain. In simple obstruction, the patient is willing to move if so requested as there is very little if any increased discomfort associated with movement. However, he is usually content to remain quiet.

In strangulation obstruction, a different picture is presented. In early cases, an attitude of apprehensive unrest may be observed. Repeatedly, patients have been observed in what may be considered a characteristic attitude or position of attempted relief. The position of relief may be divided into two phases—early active, and late passive.

In the early phase, the patient attempts to obtain relief from pain by active motion. Exhibiting a striking degree of unrest, the patient is usually found sitting up in bed, moving back and forth, or from side to side, assuming at times a position of acute flexion of trunk and extremities in an apparent effort to relieve the pain. The patient is reluctant to change from this attitude and lie quietly in the supine position for a sufficient time to allow a satisfactory examination. Occasionally, variations in this attitude may be encountered. The active position of relief was described in 29 per cent of cases in this series.

The early phase is transitory and, after a comparatively brief period, passes into what may be designated the late phase, in which a motionless position is assumed, either on the right or left side, with legs slightly drawn up. Rarely a motionless sitting position may be assumed. This late phase was first described by Evans and Bigger, and they considered it characteristic of strangulation obstruction. The author agrees but feels that this motionless position of relief is a comparatively late manifestation and that the active position precedes it and is characteristic of early strangulation. The late position of relief was described in 12 per cent of the patients in the present series.

An explanation of the sequence of events is that the active phase occurs in the early hours of strangulation before the bowel becomes heavily laden with sanguineous fluid and before any large amount has permeated the bowel wall into the peritoneal cavity. Somewhat later, depending upon the rapidity with which the strangulating process develops, the passive phase characterized by the motionless position of relief occurs, as a result of peritoneal irritation, and as suggested by Evans and Bigger, increasing traction on the mesentery.

Vomiting.

Typically, vomiting occurs early, is repeated frequently and may be entirely reflex in character at the onset. Repeated vomiting occurred in 76 per cent of cases. Regurgitant and frankly feculent vomiting occurs late in the course of the disease. Occasionally, vomiting will be delayed and infrequent.

Distention.

It should be stressed that abdominal distention is by no means always present and may be considered a comparatively late sign.

The occurrence of sudden complete strangulation of a high or mid-segment of bowel is not conducive to early distention and may be accompanied by an entirely flat abdomen. Pronounced abdominal distention occurred in 11 per cent of the patients, while the contour of the abdomen was considered normal in 20 per cent. In the remaining 69 per cent, distention was slight to moderate.

Abdominal Tenderness.

Abdominal tenderness is a characteristic physical finding. It was present in 96 of the patients in this series. It was generalized in 43 in 16 of whom a localized area of maximum tenderness was found. Thus, in 69 patients there was localization of tenderness. Tenderness was found on rectal or pelvic examination in 25 patients.

Muscular Rigidity.

Muscular rigidity is not found with the frequency of tenderness. It was recorded as being present in approximately one-half of the cases.

Mass.

Not infrequently, the strangulated loop may be palpated as a mass. In 19 cases, a mass was felt on abdominal examination and in 13 on rectal or pelvic examination.

Auscultation.

Characteristic of intestinal obstruction is the presence of high-pitched peristaltic rushes coincident with recurring colicky pain. The peristaltic sounds,

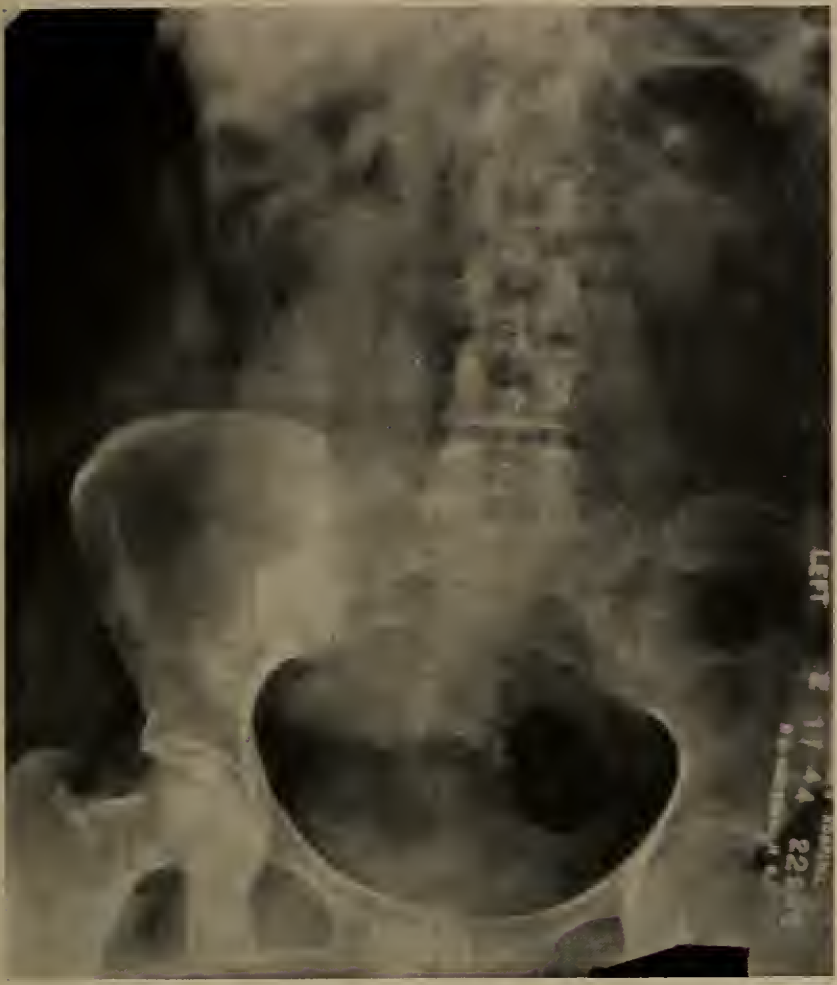


Figure 1.—Female, aged 56 years. Strangulation obstruction of 14 hours' duration, due to adhesive band. Viable bowel. A homogeneous, oval density representing the strangulated bowel can be seen, which blends with the right psoas shadow. Some gas is seen in the large bowel but no distention is present. No gas is seen in the small bowel.

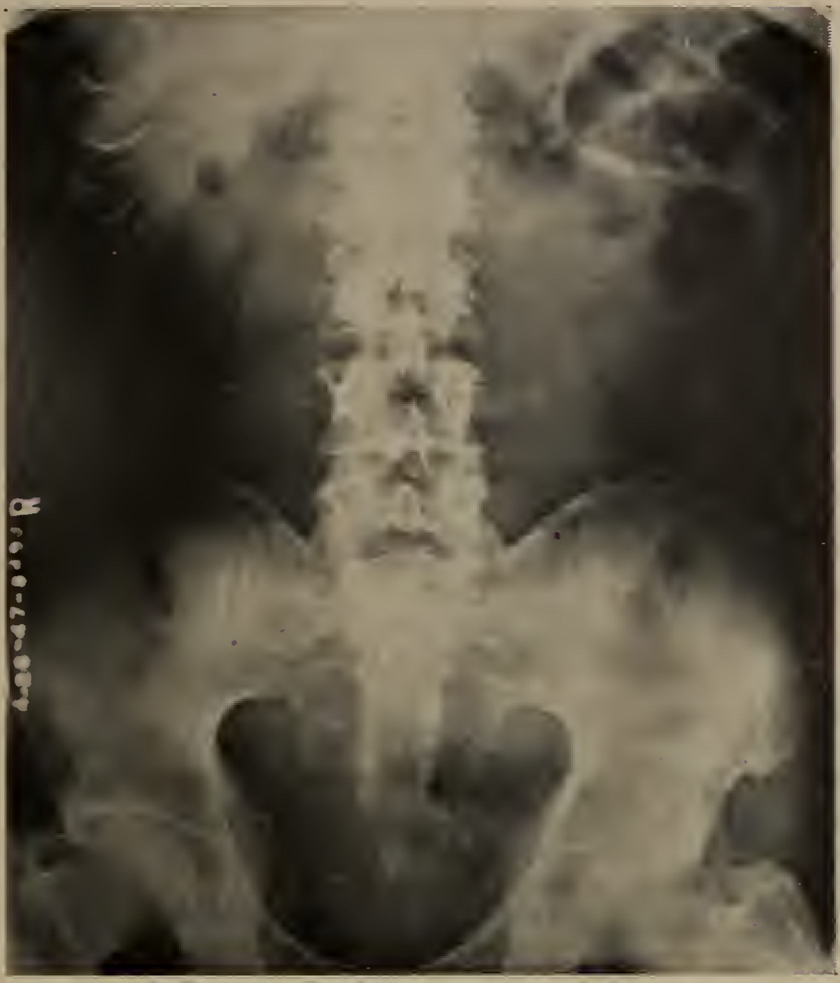


Figure 2.—Male, aged 52 years. Strangulation obstruction, duration 15 hours. Bowel non-viable. Very little gas is seen in the colon. Poorly defined loops in left upper quadrant containing gas and fluid with some apparent thickening of bowel wall and separation of loops indicating extraluminal intraperitoneal fluid.

however, rapidly decrease in frequency and intensity as strangulation develops, to become greatly diminished with only an occasional sound, and finally entire silence. For a satisfactory examination, auscultation must be continued for a period of many minutes. Peristalsis was recorded as absent in 25 per cent of the patients and as hypoactive in an additional 43 per cent.

X-ray.

The x-ray findings will depend largely upon the rapidity with which the process develops and the length of time the strangulation has been present.

In rapidly developing strangulation, the loop may distend with fluid so rapidly that a film taken within the first few hours shows distribution of gas in the large bowel, without gas being visualized in the small bowel. However, a density, faint or well-defined, indicating a mass representing the strangulated bowel, may be observed as the only suggestive x-ray finding (Figure 1).

When strangulation develops less rapidly, early x-ray films not infrequently will show one or more isolated loops, containing gas and fluid, without particular pattern. This latter finding has been emphasized by Hunt.

As fluid accumulation increases, the bowel outline becomes less distinct and the valvulae conniventes become ill-defined or entirely absent. Evidence of intraluminal or extraluminal fluid, or both, early in the course of obstruction suggests strangulation. Often there is relatively more fluid than gas within the involved loop and definite separation of adjacent loops is evident, due to accumulation of extraluminal fluid (Figure 2). A diminution in the amount of gas in the large bowel occurs but usually complete absence is not evident in early strangulation. Even in this series with its high incidence of cases in advanced stage, gas was visualized in the large bowel in more than one-third of the patients. In advanced stages, many dilated loops of small bowel may be noted, or even the stepladder appearance usually associated with advanced simple obstruction. The presence of extraluminal fluid may be revealed by a haziness or ground glass appearance of the film. The continuity of the bowel pattern may be interrupted by an area showing an absence of gas, representing the strangulated loop as described by Wangensteen.

Diagnostic Abdominal Puncture.

Abdominal puncture as a means of diagnosis may be utilized with very little risk. Neuhoff and Cohn called attention to its value in a paper published in 1926. Hill, O'Laughlin and Stoner showed that experimental strangulation in dogs could be diagnosed in this manner within four hours after onset.

While it is true that, usually, it is unnecessary to resort to abdominal puncture, occasionally there will be a case in which the early findings are insufficient for a positive diagnosis and peritoneal tap will obviate delay in surgical intervention.

Diagnostic peritoneal aspiration may be done with an 18-gauge spinal needle which preferably, although not necessarily, is inserted adjacent to the midline after the area to be punctured has been infiltrated with procaine solution. A luer syringe is attached to the needle and suction applied for a period of several minutes if necessary. The position of the needle may be changed from one location to another as indicated. If no fluid is obtained, puncture may be performed in more than one location. The needle should not be inserted through or adjacent to a laparotomy scar because of the chance that an intestinal loop fixed by adhesions to the parietal peritoneum might be punctured.

In clinical evaluation of this procedure, it may be said that a dry tap is without significance while aspiration of the characteristic bloody fluid is diagnostic. In this series, peritoneal tap was performed in ten cases, with positive results in nine.

MORTALITY RATE

The mortality rate for the series was 48 per cent. Fourteen patients died without operation because of moribund condition at the time of hospital admission. The mortality rate for patients for whom resection was necessary was 56 per cent, which was more than twice as high as the rate in the group in which simple release of strangulation sufficed.

TREATMENT

Although a consideration of the details in treatment is not within the scope of this presentation, it is well to emphasize the fundamental difference in treatment of patients with early as distinguished from late strangulation. Even in early cases, shock may be induced by reduction of circulating blood volume at the time of operation, and blood replacement by transfusion is mandatory, the amount depending upon the condition of the patient. The condition of early strangulation presents a real emergency and prompt surgical intervention should be instituted upon reasonable suspicion before irreversible changes occur.

A different situation obtains in advanced cases, with dehydration, electrolyte imbalance, excessive loss of circulating blood volume, and the pronounced distention of long-standing ileus. In such circumstances the author is heartily in accord with the view so ably expressed by Gatch that operation should not be considered necessary immediately, and should not be undertaken until hydration and chemical balance have been obtained, adequate circulating blood volume restored with stabilization of the blood pressure above the shock level, and decompression of the bowel proximal to the strangulated loop effected. Only in this way will some of these desperately ill patients be salvaged.

8467 South Van Ness.

REFERENCES

1. Baumgartner, C. J.: Survey of intestinal obstruction, Archives of Surgery, 55:607, Nov. 1947.

2. Evans, E. I., and Bigger, I. A.: Intestinal strangulation, J.A.M.A., 133:513, Feb. 22, 1947.

3. Gatch, W. D.: Fundamental considerations in the operative treatment of advanced intestinal obstruction, with special reference to the management of cases complicated by gangrene of the intestine, Surgery, 1:896, June 1937.

4. Hill, F. C., O'Laughlin, B. J., and Stoner, M.: Peritoneal aspiration in the diagnosis of strangulated bowel, Surg., Gyn. and Obst., 74:121, Jan. 1942.

5. Hunt, C. J.: Early diagnosis and roentgen manifestations of obstruction of the small bowel, Archives Surg., 57: 460, Oct. 1948.

6. Neuhoff, H., and Cohn, I.: Abdominal puncture in the diagnosis of acute intraperitoneal disease, Annals Surg., 83: 454, April 1926.

7. Wangensteen, Owen H.: Evaluation of criteria upon which the early diagnosis of acute intestinal obstruction may be made with special consideration of the value of x-ray evidence, Radiology, 17:44, July 1931.

The Diagnostic Problem in Asthma

J. Harvey Black, M.D., *Dallas, Texas*

SUMMARY

Differences in the types of asthma are due to differences in the cause of the condition. As determination of the type is important with regard to treatment and prognosis, "etiologic diagnosis" is a principal problem.

Observers in various parts of the country may disagree sharply as to the relative incidence of one type and another, a disagreement which may be based on differences in the environments in which they make their observations.

Reaching agreement on the interpretation of symptoms would be of great value. It must come from further careful, unbiased observation.

With the accumulation of knowledge regarding the conditions which cause dyspnea, the differential diagnosis of bronchial asthma has become comparatively easy. There is seldom any reason for confusion if one takes advantage of the means available to determine definitely what the condition may be. It is possible, of course, for asthma and some other condition causing dyspnea to coexist; and this may make it somewhat difficult to know whether the condition is true asthma, and, if so, just how much of the dyspnea may be due to asthma and how much to the other condition. Even this usually can be determined by observation over a short period.

To aid in the clarification of thinking on the subject, it is desirable to abandon the use of such terms as cardiac asthma and renal asthma. With the recognition of many causes of dyspnea, this term should no longer be used as synonymous with asthma, and in the light of present knowledge of the physiology and pathology of cardiac and renal function, other terms should be used to describe the dyspnea which may accompany cardiac or renal disease. Failure to make this distinction, both in diagnosis and in terminology, is the reason for inability to evaluate histories and statistics of former years and thus to know just how much asthma has existed and what the morbidity and mortality rates may have been.

Errors in differentiation may still occur, but they are usually due to failure to use the means available. The problem is not in the diagnosis of asthma but in the determination of the type of asthma. Asthma varies a great deal in etiology, symptomatology and prognosis, and the correct determination of the type of asthma is of importance in determining treatment and estimating the prognosis. These differences in type of asthma are due to the differences in the cause of the condition, so that the problem is one of "etiologic diagnosis." This does not mean simply determining whether the patient is sensitive to ragweed pollen or house dust. First, it must be known whether the asthma is due to a sensitivity at all.

The basic mechanism of the allergic reaction is unknown. It is known that it appears to be an antigen-antibody reaction, that vasodilation and smooth muscle contraction account for the local symptoms, but it is not known why some persons produce such antibodies while others do not, why the reaction occurs in some tissues and not in others, why one becomes sensitive to a certain antigen and not to others, or why one may become sensitive to a substance to which he may have been exposed for many years. All these are unanswered questions because of lack of definite information as to the basic mechanism. At present there are many who are looking to the action of histamine to explain many of the problems, but even should that hypothesis prove correct the explanation for the antibody production is lacking.

Fundamentally, all allergic reactions are the same. There is edema, eosinophilic and lymphocytic infiltration and, when the reaction is often and frequently repeated, there may be necrosis or fibrosis or muscle hypertrophy resulting. Most allergic reactions are reversible, but irreversible changes may be found following recurring attacks. Wherever the reaction may occur the differences in cellular and tissue reactions and the symptoms are dependent upon the type of tissue involved and its location. The presenting symptom may be headache or intestinal colic, depending solely upon the location of the reaction.

Respiratory allergy is simply an allergic response in the respiratory tract. The reaction is the same as that elsewhere. There is no fundamental difference between hay fever and asthma. The differences are due solely to the tissues involved in the different locations.

For purposes of discussion, asthma may be divided into allergic and non-allergic; seasonal and perennial; extrinsic and intrinsic; infectious and non-infectious, and psychosomatic and organic.

Presented before the Section on Allergy at the 78th Annual Meeting of the California Medical Association, Los Angeles, May 8-11, 1949.

These groups are not mutually exclusive, for asthma may be perennial and infectious; it may be non-allergic and psychosomatic and perennial. But it may be worth while to consider asthma from these different viewpoints to show the significance of them.

The terms allergy and allergic should be restricted to conditions due to an antigen-antibody mechanism, for it was this that was contemplated by von Pirquet when he proposed these terms. If asthma is purely psychosomatic in origin, it may be true asthma, but it is not an allergic condition. If intrinsic asthma is not related to sensitivity to any antigen, it may be true asthma, but it is not allergic. This may be considered quibbling, but such a distinction may help to clarify the thinking about these conditions.

If those limiting their work to this field, but working in different parts of the country, should be asked what part of the asthma they see is believed to be allergic, that is, on an immunologic basis, the answers would vary widely. It is a remarkable thing that competent physicians may reply that not more than 50 per cent of the asthma which they see is truly allergic—the other 50 per cent is due to other causes. Others, equally competent and equally honest, will state that probably 90 per cent of the asthma they see is allergic. The explanation of this disparity may be apparent upon further discussion of the classification.

There can be no argument, of course, as to whether asthma is seasonal or perennial. The history, if at all satisfactory, will offer this information. It is an important distinction to make, even though it is simple. Seasonal asthma, like seasonal hay fever, is almost without exception due to pollen. The asthma coincides with the blooming period of the plant to which the patient is sensitive and is absent the rest of the year. Treatment of these patients gives rather satisfactory results. For an unknown reason, pollen asthma responds better to pollen therapy than does hay fever. But the point of greatest importance is that seasonal asthma due to pollen seldom develops into perennial, chronic asthma. This is not an infallible rule, but pollen asthma rarely is a forerunner of chronic asthma.

Infectious asthma is a term applied to a wheezing dyspnea associated with symptoms of infection in the respiratory tract. In some parts of the country, the diagnosis of infectious asthma is made frequently. In fact, it may make up a large part of the total. On the other hand, some investigators believe that infectious asthma is an uncommon condition and the diagnosis seldom justified. How can we account for this difference?

The first allergic reaction which was recognized as such was the tuberculin reaction. Allergic reaction to bacteria is theoretically possible; there can be no objection to the diagnosis on this basis. But no one has yet been able to establish the fact that any asthma is due to an immunologic reaction to bacteria. Skin tests may show positive reaction to bacteria from the sputum or from other materials, but such a reaction may mean only that the patient has been sensitized to that organism, possibly months or years previously. It is not dependable evidence that the present asthma is due to the sensitivity. Again, as was learned in the days of toxin-antitoxin, children who had been injected with this mixture might subsequently show positive skin reactions to horse serum yet have no clinical sensitivity to it. Those who have worked most with test extracts of bacteria and with vaccines in treatment will usually be the first to admit the insecurity in depending upon them.

In many instances patients state that asthma started soon after the occurrence of some infection. Commonly patients report that attacks occur with colds, and, of course, sinusitis or bronchial infection may be concurrent with asthma. On this basis, many diagnoses of infectious asthma are made. These factors do not justify such a diagnosis. A mother may state that her child first had asthma following whooping cough, measles, mumps or other infection, and that the attacks are restricted largely or entirely to the times when he has a cold. In these cases it is as common to find some food or environmental factor responsible for the asthma as it is in the cases in which there is no association with any infection.

It should be remembered that there are factors which may precipitate attacks of asthma, but do so only in the patient who is allergic to some antigen. For example, a patient may be allergic to egg and yet have attacks of asthma only when he has a cold, when the weather changes suddenly, or with an emotional upset. In these instances, the cold is not the primary cause of the asthma, as may be shown by the fact that if the offending food is kept out of his diet, he may have a cold but not asthma with it. In other words, the food to which he is sensitive is the basic factor, but the sensitivity may be slight and he may be able to eat the food without asthma when he has no cold, the weather does not change or he has no emotional disturbance. But if he continues to eat the reacting food and then has a cold, the two together will produce an attack. As a friend remarked, "The antigen loads the gun and the cold pulls the trigger." There is abundant evidence that this explanation is correct.

If patients who are believed to be truly allergic are removed from the classification of "infectious" asthma, how many of those truly infectious are left? In some parts of the country the remainder may be considerably greater than in others. But it is difficult to form any acceptable statement until there is agreement at least on the interpretation of symptoms. That ought to be simple, but queerly enough, it is not.

There are those investigators who divide asthma into the extrinsic and intrinsic types, while others do not accept this as a valid division. Those who do, believe that in some people asthma develops without evidence of sensitivity to any external substance.

but due to some metabolic or other type of aberration within the body. The patients are said to be usually past middle life at the time of onset of the asthma, their attacks are not separate but continuous, nothing can be found to account for it, the condition is progressive and not controllable except as help may be had for brief periods by medication, and the death rate is high. Clinically, intrinsic asthma is said to differ definitely from that which may be called extrinsic, and the prognosis is much worse.

It is a very interesting fact that there are many investigators who are sure that in a considerable number of patients with asthma the disease may be classified as intrinsic in origin, while there are others probably of equal intelligence and with equal experience who say that such patients have not been observed by them. How can such divergence of opinion be explained? Since there is a great deal of difference in the mortality rates associated with the two types, it is a matter of importance to differentiate them accurately. Is the diagnosis of intrinsic asthma erroneous and do these patients have extrinsic asthma which has not been adequately diagnosed from an etiologic standpoint? There are those who think so. Or are those in the other camp failing to make a valid and important distinction? Or is it possible that both groups are right and that the difference may be due to geographic, climatic or other differences? The author has observed only one patient who met all of Rackemann's criteria for intrinsic asthma. In that patient it developed in middle life, it was continuously progressive and uncontrolled, and after seven years of futile effort to find relief, the patient died. If there is such a condition as intrinsic asthma, this was an example of it. The queer thing is that this is the only case of asthma observed by the author which was felt to belong in the "intrinsic" classification. Many cases of asthma for which there was no adequate explanation have been oserved, although it is believed that there was such an explanation and it merely was not found. And these unexplained cases were not, by accepted clinical standards, intrinsic asthma. If in 30 years of experience, only one case which seems to conform to the clinical picture of intrinsic asthma has been observed, it would seem that the condition is not common in the part of the world in which the author works.

As was stated previously, in some parts of the country asthma is considered infectious because it is associated with a certain clinical history. Similar historical correlations were noted in patients observed by the author, but they were not interpreted as indicating allergic disease due to infection. The difference here is in the interpretation of the patient's history and not in finding, or failing to find, a certain clinical syndrome. Physicians may differ as to how to interpret statements, but there should be no difficulty in seeing the same symptoms when competent observers are seeing them. And the author believes that many physicians do not see the syndrome labeled "intrinsic asthma." Therefore there must be cases of this kind much more frequently in some parts of the country than in others, and it is probably neither kind nor wise to insist that there is no such thing. But the fact remains that resolving this question is a matter of more than academic interest and deserves attention.

PSYCHOSOMATIC ASTHMA

Aside from the disagreement regarding the diagnosis of infectious asthma and as to the validity of the diagnosis of intrinsic asthma, it would seem that there ought to be some common ground on which agreement could be reached. But not yet. There still remains the matter of so-called psychosomatic asthma. And here again there is much argument and little agreement.

Everyone probably will admit that emotional states may play a part in the precipitation of allergic reactions. This is a familiar kind of response. Asthma attacks apparently induced by an emotional disturbance have been observed; urticarial attacks resulting from psychic upsets appear to be fairly common. Possibly allergic reactions of all kinds may be definitely influenced by the emotions.

But this is not the problem on which there is such definite—and sometimes so violent—disagreement. What is needed to know, and what some investigators affirm and others vigorously deny, is whether emotional disturbances in and of themselves can produce the allergic state or, to be technically accurate, reactions indistinguishable from the allergic reaction. For it may be said here, if there is such a thing as a psychosomatic asthma, it is not allergic. It may be asthma.

Some psychiatrists assert that asthma is frequently due entirely to resentments, frustrations, feelings of guilt, and other psychic states. They would exclude all other factors and make this the entire explanation for the somatic symptoms. Allergy would be relegated to a minor position as a cause of trouble. Opposed are many investigators who believe that emotional disturbances play only an accessory role and that the basic mechanism is that of allergy.

Where the truth lies cannot be said now. The author's belief is that it lies somewhere between these extremes; that allergic reactions may be precipitated or modified by emotional states, but that, with comparatively few exceptions, these are accessory and not the basic factor. Accurate information on which to base an unbiased belief will not be available until both those working in the field of psychiatry and those in the field of allergy are willing to cooperate in an unbiased fashion in the study of many patients.

Probably not so important, because it does not involve fundamental considerations of theory, is the question of the importance of allergy to foods. It is a good illustration of the need for straight thinking and objective clinical investigation. It would seem that after 30 years of clinical work in allergy, there should be decision as to just how important foods are as the cause of asthma, but opinions are as widely separated as the poles. There are those who believe that foods are the most frequent and the most important etiologic factors and those who believe that foods may safely be disregarded as the cause of asthma. How can this variance be explained? There are probably two or three reasons involved. First, there may easily be a geographic or climatic variation. It may be that in some areas pollens are abundant, respiratory infections very common and industrial dusts considerable. It is quite possible, under such conditions, that the incidence of asthma due to sensitivity to food may be relatively less important. On the other hand, in an area where pollen is less, respiratory infections infrequent, and atmospheric contamination with industrial dusts and fumes largely absent, there may be few patients with asthma from these causes and the proportion of food-sensitive persons hence increased. Second, and possibly more important, is the fact that many allergists, while trying to be scientific in attitude, are in reality refusing to admit the error of an idea because the idea was originally accepted without critical thinking and was never afterward subjected to unbiased thinking and clinical trial. It seems incredible that intelligent men should still sneer at each other about belief in or against the role of food as an allergen. Surely it is susceptible of proof, and men who want to know the truth rather than to support their own beliefs should be able to determine just where the truth lies. The correct answer to this question is long overdue.

Every scientific physician realizes the difficulty of reaching safe conclusions in clinical practice. There is such a great number of variables involved in the treatment of human beings that one is justified in forming conclusions only after many and arduous observations over much time. Anything less than this leads to error, as some have had occasion to realize. For this reason, answers to our problems cannot be expected at once although they are badly needed. But the questions of the role of infection in asthma, the validity of a diagnosis of intrinsic asthma, and the extent of the influence of psychic states upon the production of asthma are of vital importance because both morbidity and mortality rates are influenced greatly by the answers.

These are some of the problems involved in the diagnosis of asthma. As has been stated, the differentiation of asthma from other conditions attended by dyspnea is usually not a very difficult task. But a consideration of the foregoing statements illustrates the difficulties attendant upon an etiologic diagnosis. These statements show that a correct diagnosis of the type of asthma is most important, for it determines the treatment and the outcome of the condition. And unfortunately, they show the complete lack of agreement as to such diagnoses. Also they show the opportunity for unbiased, careful observation. The days of clinical research are not gone.

Medical Arts Building.

Some Recent Advances in the Symptomatic Treatment of Osteoarthritis

RICHARD D. MILLER, M.D., *Pasadena*

SUMMARY

In over 400 treatments with procaine intravenously, moderate to good improvement was noted in about 60 per cent of patients with osteoarthritis and radiculitis. Definite improvement after a single treatment was noted occasionally, but more often relief was not obtained until six to eight treatments had been given. Symptoms due to osteoarthritic changes in peripheral joints did not respond as well as did those due to spinal arthritis.

Curare relieves some of the pain of arthritis due to muscle spasm, but does not bring improvement in motion of the small joints, such as those of the fingers.

Preliminary experience with a new synthetic drug, 3-ortho-toloxy-1,2-propanediol (Tolserol®), which produces muscular relaxation differing from that induced by curare, suggests further clinical trial.

Intra-articular acidification by injection relieved pain in about 50 per cent of patients with osteoarthritis of the knee.

IN the following presentation, recent advances in the treatment of arthritis (other than treatment with adrenocortical substances) will be examined, partly on the basis of a review of the literature, and partly summarizing original experience.

JOINT INJECTION

Joint injection is a helpful and yet very simple means of reducing arthritic discomfort. According to published reports this procedure has led to encouraging results.

It has been repeatedly shown that the joint fluid in rheumatoid arthritis frequently reaches a pH of 7.8, while in osteoarthritis pH values of 8 and more have been encountered. Apparently an "alkaline" joint is a painful joint. Hematomata, on the other hand, as they are associated with bone healing, are characterized by a progressively more acid menstruum, as demonstrated by Stirling[13] in 1932. He was furthermore able to show that simple hematomata not connected with fractures also have a low pH, and that under certain circumstances pus has a similar degree of acidity. It has been suggested that an acid medium is necessary for optimal polymorphonuclear leukocytic activity and mesoblastic cell growth.[14]

Regeneration of joint cartilage is not usually considered possible, but Waugh observed such a process following successful joint acidification.[15] Smith-Petersen[12] reported that after excision of the head of the femur, a layer of fibrocartilage forms in the acetabulum and over the stump of the neck.

At a recent symposium on the treatment of arthritis at the Orthopedic Hospital in Los Angeles, several cases were presented, documented by roentgenograms, in which regeneration of the articular cartilage had apparently taken place within the hip joint. While joint acidification had not been the method of treatment in these instances, the result seems nevertheless to be of considerable importance, as it may contribute to a better understanding of the question whether regeneration of articular cartilage is indeed possible.

Various media have been employed for injection of the "alkaline" joint, especially lactic acid, acid potassium phosphate, and procaine acidified with lactic acid. A number of effects may be observed after the fluid has been introduced into the joint cavity. Due to its lubricating action, joint crepitus usually disappears; the anesthesized joint is furthermore used to a much greater extent; in cases of chronic rheumatoid arthritis of long standing, adhesions may be broken down; and in osteoarthritic patients the articular capsule may be stretched, and thus joint tension reduced.

In a series of 70 joints treated by acid injection, Baker and Chayen[1] found either no or only slight improvement in 34 cases, while in 36 instances moderate to great improvement was noted. Mawson[10] reported upon 26 patients, and 23 were classified as improved while three others remained unchanged. Crowe,[5] in a series at Charterhouse, found that treatment with acid potassium phosphate led to good results. While no exact figure can be determined on the basis of published reports, a perusal of the literature on the subject leads to the impression that injection treatment is followed by improvement of varying degrees in 50 to 80 per cent of cases.

In a series observed by the author, when osteoarthritis of the knee was treated by injection with acid potassium phosphate or procaine, good improvement was noted in just under 50 per cent of cases. Apparently it makes little difference whether acid potassium phosphate (1 per cent) or procaine (2 per cent) acidified with lactic acid to a pH of 5.2 is used. But it is of importance to note that im-

---

Presented before the Section on Industrial Medicine and Surgery at the 78th Annual Meeting of the California Medical Association, Los Angeles, May 8-11, 1949. (Revised, December, 1949.)

provement cannot be expected from subsequent treatments if no relief or merely a short-lived cessation of pain resulted from the first injection. For patients responding well to intra-articular acidification, a course of two to four weekly treatments will afford relief from arthritic pain during a period of about four to six months.

For injection into the knee joint an approach from the lower pole of the patella and just medial to the patellar ligament was used. It was found to be preferable that the knee be slightly flexed over a firm pillow or a sandbag. First a skin wheal of procaine was raised, using a small gauge needle; then a 2-inch, 22-gauge needle was substituted and pushed forward into the joint cavity. Fluid could be aspirated, and at the same time it was noted that the plunger could be advanced without encountering further resistance. Five cc. of procaine (2 per cent) was injected into the joint cavity, followed after several minutes by 15 cc. of acid potassium phosphate (1 per cent). There is no necessity that the knee be immobilized; in fact, a moderate amount of walking is advisable, in order to stretch the joint capsule. According to the recent literature the most favorable results have been obtained by injection into the knee joint. In the presence of considerable mechanical derangement or of malalignment of weight-bearing joints, however, the results are uniformly poor.

The recent trend has been to use acidified procaine, as this medication produces a less pronounced tissue reaction if it is accidentally injected into the periarticular tissues. This fact is of still greater importance in injections into the hip joint, as it is sometimes difficult to be certain that the tip of the needle has penetrated into the joint capsule.

Intra-articular joint injection is not indicated in cases of acute arthritis, as manifested by heat, redness, or recent effusion. Chronic effusion, on the other hand, does not contraindicate injection, provided neither redness nor heat is encountered and the sedimentation rate is normal.

For injection into the hip joint either the anterior, the lateral, or the posterior approach may be used. The capsule of the hip joint is deep-seated and in a number of instances may reach a thickness of up to one-half inch; thus intra-articular injection into the hip joint presents certain technical difficulties—a fact which is especially regrettable as the present methods of treating osteoarthritis of the hip joint can only be regarded as unsatisfactory.

In the lateral approach, the needle is inserted about one inch above the midpoint of the great trochanter. It is directed upward and inward, so as to follow the neck of the femur. If the needle encounters only bone, it is partially withdrawn and reinserted at an increased angle, until the tough joint capsule is felt. When injections into the hip joints of cadavers were checked by means of roentgenograms, it became apparent that even in the most expert hands the needle entered into the joint capsule proper only in a small number of cases. However, the procaine-lactic acid mixture may prove of considerable therapeutic value even when introduced only into the periarticular tissue. The average dose for injection into the knee and hip joints is 20 cc.

INTRAVENOUS INJECTION OF PROCAINE

Intravenous injection of procaine is at present undergoing clinical trials in many institutions. The pain-relieving action of this procedure is not as yet completely understood, but it is known that following administration by the intravenous route, procaine or its breakdown products are about eight times as concentrated in inflamed or bruised tissue as in normal tissue.[6] Graubard and Peterson[7] have pointed out that dysfunction in the capillary bed of the joint tissues produces porosity and edema with resulting accumulation of metabolites in the interstitial tissue. As the metabolic products increase, pain also increases. With the increased rate of concentration of procaine or its breakdown products within the tissues, the nerve endings of the sympathetic fibers in the capillary wall become anesthetized and relaxation of the vessel takes place, resulting in normal circulation. Graubard and Peterson[7] furthermore suggest that procaine may inactivate cholinesterase, thus allowing for a more sustained action of acetylcholine and decreasing the stimulation of the sympathetic ganglia and fibers.

Intravenously administered procaine is hydrolyzed into para-aminobenzoic acid and diethylaminoethanol,[4] the latter compound being capable of producing local anesthesia, general analgesia, and a certain degree of antiallergic action. Formerly it had been assumed that destruction of procaine took place in the liver, but perfusion experiments have shown that not more than 1 per cent of the drug is hydrolyzed by this organ, while the major portion is transformed in the plasma. Procaine added to fresh plasma was shown to be 80 to 100 per cent hydrolyzed within two minutes.[4]

Most investigators have adopted the so-called procaine unit, which is 4 mg. of procaine per kilogram of body weight, given in a 20-minute period. The author prefers to use a standard 250 cc. intravenous bottle containing 100 cc. of normal saline, to which is added the correct amount of procaine. For example, a patient weighing 50 kilograms would receive 200 mg. of procaine during a 20-minute period. Ten cc. of procaine (2 per cent) is therefore added to the 100 cc. of normal saline, and the intravenous drip is adjusted to empty within 20 minutes. Using this amount of procaine there were no reactions except slight dizziness and transient diplopia, and the course of injections had to be discontinued in only three cases because of reactions. As early as 1947, Graubard and his co-workers[8] noted that in 2,000 administrations procaine sensitivity was not encountered in a single instance, nor was it ever found necessary to discontinue use of the drug. In January of 1949, Graubard and Peterson[7] reported on 110 cases of osteoarthritis, receiving an average of six infusions. Good or fair relief of pain combined with increased mobility was obtained in 104 of the 110 cases. In another series of 22 patients with traumatic arthritis, good to fair results combined with increased mobility were noted in 21 cases. Patients with rheumatoid arthritis received on the average 8.3 infusions, and the results in 28 out of 33 cases were good to fair, and increased mobility was reported in 26 instances.

While few undesirable reactions occurred in a series of patients given intravenous infusions by the author, the good results cannot be described as dramatic. Up to the present, treatment with intravenous procaine has been restricted to patients with complaints due to osteoarthritis and radiculitis. Definite improvement was occasionally seen after the first treatment but more often the relief was not pronounced until six to eight treatments had been completed. In over 400 treatments with intravenous procaine the author observed moderate to good improvement in approximately 60 per cent of patients. Symptoms due to osteoarthritic changes in peripheral joints did not respond as well as those due to spinal arthritis. The first two infusions were usually administered within a single week and one a week is given thereafter.

CURARE

About 70 per cent of the pain an arthritic patient experiences is not directly due to inflammation of the joint but rather to secondary muscle spasm. Nature tends to splint a diseased joint, and this effect is brought about through protective muscle spasm above as well as below the involved area. In this manner, however, not only stiffness but also pain is produced. There exists evidence indicating that once muscle spasm has been initiated, it tends to start a reflex cycle:[9] By stimulating the receptor mechanism of proprioceptive nerves in muscle and connective tissue, impulses are sent to the cord which give rise to reflexes causing further muscle spasm. This assumption received confirmation from the fact that many patients experience pronounced relief of pain after medication with curare. Curare possesses a selective action, affecting only the end plates of motor nerves, but not the pain fibers, and thus any alleviation of pain brought about through use of the drug must be due to cessation of muscle spasm. Patients with rheumatoid arthritis as well as osteoarthritis associated with muscle spasm will show some subjective improvement after the use of an adequate dose of curare. This is particularly true in cases in which the spasm involves large groups of muscles, especially the paraspinal muscles. It is for this reason that curare is most useful in the treatment of Marie-Strümpell arthritis.

For prolonged action curare is prepared with myricin, in peanut oil containing 27 mg. of d-tubocurarine per cc., which is equivalent to 180 units of Intocostrin.® At room temperature the material is solid, due to the presence of wax which has a relatively high melting point. Before administration the rubber-stoppered vial is placed in a hot water bath until the substance is liquefied. Syringe as well as needle must be absolutely dry. Even the minute amount of water which will remain in a needle sterilized in alcohol constitutes a source of danger. For this reason the needle should be placed in a steam sterilizer to which vacuum is applied during the last part of the procedure. Curare is water-soluble and will be liberated from the oil and wax at too rapid a rate if water is allowed to mix with the material in the syringe. As a final precaution the needle is heated over an open flame just before it is used. In addition the syringe must be heated, as the preparation will solidify when it comes into contact with the cold glass.

According to the dosage schedule followed by the author, the first injection is 0.5 cc., provided the patient weighs at least 100 pounds. The second and following doses are usually 1 cc., given at intervals of from five to seven days. The preparation is injected deep into the hip. In order to avoid accelerated absorption of the drug, the patient is instructed to refrain from vigorous exercise or from applying heat to the site of injection. The patient will note increasing relief from stiffness beginning about two hours after treatment, and lasting from 12 hours to five days, and in a few cases even to seven days. Morning stiffness is reduced, and the patient will be able to move about with greater ease and less pain. No improvement of motion has been noted in the small joints, such as the fingers. In only one instance did muscular relaxation reach such a degree as to result in lid drop, lasting for a period of about four hours. As the small muscles of the body are affected before weakening of the large muscles occurs, the appearance of lid drop will give fair warning before real interference with the muscles of respiration takes place.

3-ORTHO-TOLOXY-1, 2-PROPANEDIOL

A new synthetic drug, 3-ortho-toloxy-1, 2-propanediol, sold in this country as Tolserol,® is one of a long series of drugs tested for ability to produce relaxation of skeletal muscles.

Berger[2] has pointed out that the muscular relaxation produced by Tolserol is unlike that obtained with curare, because the drug acts on different structures, and furthermore it affects the several groups of muscles in different order and to varying degrees. With curare, the muscles of cranial innervation are the first to be impaired, and paralysis of the peripheral and intercostal muscles, which is the next action of the drug, occurs as a rule only subsequent to lid drop. With Tolserol, on the other hand, the muscles of the posterior half of the body are first affected, then the action reaches the peripheral and intercostal muscles, subsequently the cranial muscles, and last the diaphragm. The end plates of the motor nerves are not affected by Tolserol, but it acts as a depressant of brain stem and spinal cord.[11] The pain-spasm reflex cycle is interrupted at the level of the spinal cord, and larger doses of Tolserol will diminish the functional activity of the central nervous system.

According to Schlesinger and his co-workers,[11] Tolserol proved most successful in the treatment of muscle spasm in low back pain, and relief was brought about within a few seconds after intravenous injection of the drug. No muscle weakness was encountered when amounts sufficient to obtain this desired relief were employed. The pain of Marie-Strümpell arthritis was reported to respond equally well to administration of Tolserol. Berger and Schwartz[3] found that Tolserol given by mouth was effective in relieving muscle spasm in arthritis of the cervical part of the spine, subacromial bursitis, and osteoarthritis of the hip joint. In some cases the action of the drug proved merely transient, while in others it was indefinitely prolonged. Blood pressure, respiration, and heart rate were not affected; diplopia and mild muscular incoordination, occasionally encountered after intravenous injection of the drug, were absent after oral administration.

From the author's clinical experience it might be said that an oral intake of 500 mg. to 2 gm. daily is necessary to obtain muscular relaxation. While the usefulness of Tolserol in the treatment of various types of arthritis can be substantiated only on the basis of a large series of patients, preliminary experience with this drug suggests continued clinical trial.

65 North Madison.

REFERENCES

1. Baker, D. M., and Chayen, M. S.: Treatment of arthritis by intra-articular injection, Lancet, 1:93-97, Jan. 17, 1948.

2. Berger, F. M.: The mode of action of Myanesin, Brit. J. Pharmacol., 2:241-250, Dec. 1947.

3. Berger, F. M., and Schwartz, R. P.: Oral Myanesin in treatment of spastic and hyperkinetic disorders, J.A.M.A., 137:722-774, June 26, 1948.

4. Brodie, B. B., Lief, P. A., and Poet, R.: The fate of procaine in man following its intravenous administration and methods for the estimation of procaine and diethylaminoethanol, J. Pharmacol. and Exper. Therap., 94:359-366, Dec. 1948.

5. Crowe, H. W.: Treatment of arthritis with acid potassium phosphate, Lancet, 1:563-564, April 29, 1944.

6. Graubard, D. J., Kovacs, J., and Ritter, H. H.: The management of destructive arthritis of the hip by means of intravenous procaine, Ann. Int. Med., 28:1106-1116, June 1948.

7. Graubard, D. J., and Peterson, M. C.: Intravenous procaine in the management of arthritis, Connecticut State Med. J., 13:33-36, Jan. 1949.

8. Graubard, D. J., Robertazzi, R. W., and Peterson, M. C.: Intravenous procaine: a preliminary report, New York State Med. J., 47:2187-2191, Oct. 15, 1947.

9. Jones, C. W., LeCompte, C. B., and Kabat, H.: Studies on neuromuscular dysfunction: use of curare to differentiate muscle spasms from organic changes in limitation of passive motion at joints, South. Med. J., 39:799-804, Oct. 1946.

10. Mawson, R.: Treatment of osteoarthritis by lactic acid injection, Brit. Med. J., 2:691-693, Nov. 9, 1946.

11. Schlesinger, E. B., Drew, A. L., and Wood, B.: Clinical studies in the use of Myanesin, Am. J. Med., 4:365-372, March 1948.

12. Smith-Petersen, M. N.: As cited by Waugh, W. G.[15]

13. Stirling, Robert I.: Report of investigation into process of the healing of fractured bones with some clinical applications, Tr. Med.-Chir. Soc. Edinburgh, pp. 203-228, 1931-1932; in Edinburgh M. J., Dec. 1932.

14. Waugh, W. G.: Treatment of certain joint lesions by injection of lactic acid, Lancet, 1:487-489, Feb. 26, 1938.

15. Waugh, W. G.: Mono-articular osteoarthritis of the hip, Brit. Med. J., 1:873-874, June 23, 1945.

MEDICAL PROGRESS:

Histamine and the Antihistaminic Drugs

Edmund L. Keeney, M.D., *San Diego*

SUMMARY

The tissues affected by histamine and anaphylactic reactions are identical. Epinephrine antagonizes the action of histamine by acting on effector cells in a direction opposite to that of histamine. The so-called antihistaminic drugs block rather than antagonize the action of histamine. The injection into the human body of epinephrine or certain antihistaminic substances provokes the release of histamine and thereby produces a rise in the histamine blood level.

There is a remarkable conformity of potency of antihistaminics as determined by Dale experiments and by histamine intoxication experiments in the intact guinea pig. Neoantergan, Pyribenzamine and Histadyl are usually superior to other compounds when potency is assayed by these methods.

All antihistaminics provide similar protection again animal anaphylaxis. Larger doses are necessary to protect against anaphylaxis than against histamine intoxication.

The differences in potency as determined by Dale experiments and histamine experiments in animals are not found in clinical use. One compound is not generally superior to all others in the treatment of any one or several allergic disorders.

The antihistaminic drugs are beneficial in the symptomatic treatment of allergic rhinitis, acute urticaria and angioneurotic edema, and mild non-infective bronchial asthma. Their effectiveness in the management of moderately severe and severe non-infective bronchial bronchial asthma; infective bronchial asthma; migraine; atopic dermatitis (disseminated neurodermatitis), and pruritus of skin disorders other than acute urticaria and angioneurotic edema, is not worthy of particular commendation.

The size of the dose of any antihistaminic substance influences the incidence of but not the type of side-effect that may accompany its usage. The quality of side effects varies according to the drug, although there is an individuality of response for each patient which must be reckoned with. In selecting an antihistaminic compound it is necessary to consider the percentage of cases in which side-effects occur, as well as the percentage of good results. Optimal results are obtained by employing combinations of compounds and changing from one to the other as the case demands.

THE principal actions of histamine are: (1) to evoke contraction of the smooth muscle in the bronchioles, intestines and uterus; (2) to dilate arterioles and cause increased permeability of capillaries; and (3) to act as a secretogogue for the lacrimal, nasal, pulmonary and digestive glands of external secretion. The most prominent pharmacological effects of histamine, therefore, are due to its action upon involuntary muscle, upon vascular endothelium and upon the glands of external secretion.

In the anaphylactic body the only tissues which, according to present evidence, are directly responsive to the antigen-antibody reaction are involuntary muscle, capillary endothelium and possibly certain glandular cells. The tissues affected by histamine and anaphylactic reactions are identical and it has naturally been assumed that the tissue response from the antigen-antibody reaction is due to a release of histamine or a histamine-like substance.

Epinephrine favorably combats the anaphylactic reaction. Furthermore, epinephrine and histamine act on effector cells in opposite directions and the action of one tends to neutralize the action of the other. Epinephrine, therefore, is an effective antihistaminic substance and this type of antihistaminic action is spoken of by the pharmacologist as physiologic antagonism. This physiologic antagonism between epinephrine and histamine may be at play within the body constantly as a compensatory mechanism. To lend support to such a theory is the recent evidence that the intravenous administration of epinephrine or synephrine provokes a significant increase in the histamine blood level. The percentage of rise in the histamine blood level in allergic and normal individuals following the intravenous injection of 0.2 mg. of epinephrine is similar, although the (resulting) histamine blood level in allergic patients is frequently higher (160 ug. per cc.) than

---

Presented before a joint meeting of the Sections on General Medicine, General Practice and Allergy at the 78th Annual Session of the California Medical Association, Los Angeles, May 8-11, 1949.

that found in normal controls (60 to 80 ug. per cc.).[85, 6, 79, 83]

An exemplification of the extent to which eccentricity may accompany scientific endeavors is the confusing evidence that there is an increase in the blood histamine level following an injection of either Antergan,® Neoantergan® or Phenergan.®[64] To explain this aberration from logical expectancy Pellerat[64] has conceived the theory that tissue histamine is displaced by antihistaminic substances and liberated into the blood. The acceptance of Pellerat's data must await confirmation by other investigators.

Another facet to the inspiring theory of the compensatory mechanism between histamine and epinephrine has lately been added. Fatal pulmonary edema in rabbits and guinea pigs following intravenous epinephrine can be prevented by pretreatment with antihistaminic substances. The explanation ventured is that pulmonary edema from epinephrine is the sequela of histamine release.[35, 69]

Recently[92] it has been proposed that "epinephrine-fastness" may be partially due to the release of histamine by epinephrine. In other words, the successive administration of epinephrine to an "epinephrine-refractory" asthmatic patient might act to aggravate the condition by releasing additional histamine.

It occurred to the author that the unfavorable reaction in the nasal mucous membranes of patients following the indiscriminate usage of vasoconstrictor drugs might be due to the local release of histamine. Could it be, therefore, that the deleterious local effects of epinephrine, Privine,® Neosynephrine® and ephedrine that are frequently observed in habitual users of these drugs are due to the liberation of histamine in the nose? And could such a reaction be prevented by adding antihistamine substances to vasoconstricting nasal solutions? In an attempt to answer these questions, nasal solutions containing (1) Privine 0.05 per cent and Pyribenzamine® 0.5 per cent and (2) Privine 0.05 per cent and Antistine® 0.5 per cent have been prepared by the Ciba Pharmaceutical Company. To date such solutions have been given to 100 patients with allergic rhinitis and although at this early date it is difficult and premature to judge their value, certain impressions have been acquired. The symptomatic relief obtained from both preparations has been spectacular; no unfavorable reactions from Privine have been encountered; and two patients who could not tolerate Privine alone have used both of the combined preparations with impunity. The complaint of burning in the nose that is known to follow at times the instillation of Pyribenzamine solution (0.5 per cent) has been observed to occur from the Privine-Pyribenzamine mixture. The Privine-Antistine solution, however, rarely causes burning. As to effectiveness the two mixtures are comparable.

Epinephrine and related vasoconstrictor drugs, therefore, inasmuch as they act in antagonism to histamine, are well defined as antihistaminics. However, may Benadryl,® Pyribenzamine,® Histadyl® properly be called antihistaminics? These so-called antihistaminics, by themselves, do not cause any significant degree of muscular relaxation nor do they have any direct effect upon the peripheral blood vessels. They are drugs that block, rather than antagonize histamine. In other words, the mechanism of action is similar to that by which atropine blocks the effects of acetylcholine. The term histaminolytic would be more applicable.[28] In this presentation, however, the term antihistaminic as it is commonly interpreted and defined in the medical literature will be employed.

Within the past three years the medical literature has been studded with reports on antihistaminic substances. Because of the great and unfortunate variety of techniques used in studying these compounds it has become increasingly difficult and hazardous to interpret, analyze, compare and evaluate the data submitted. Particularly treacherous is the evaluation of clinical observations where the personality equations of the investigator and the patient are so variable. Then, too, the very nature of the allergic condition makes for difficulty in the appraisal of any therapeutic agent.

For the sake of clarity, accuracy and simplicity the data analyzed in this report will be presented under the following headings: (1) chemistry, (2) in vitro experiments, e.g., studies employing the Dale technique, (3) in vivo animal experiments concerned with activity against histamine intoxication and against anaphylaxis, (4) clinical observation, and (5) side effects.

CHEMISTRY

Upon scrutiny of the chemical structures of the multifarious antihistaminic substances, certain factors common to the most potent ones become apparent. Many can be segregated into two groups dependent upon the existence in the molecule of the basic unit, ethanolamine (Benadryl, Decapryn) Figure 1, or the basic unit ethylenediamine (Pyribenzamine, Histadyl, Neoantergan, Antergan, Bromothen, Chlorothen, Neohetramine) (Figure 2). Common to these two groups is a terminal N atom which is a tertiary amine and this component of the structure contributes favorably to the potency of the entire molecule.[30] Dimethyl amine instead of diethyl amine groupings on the tertiary amine make the compounds less toxic. The chain length between the O and the N or the N and the N atoms is not more than two C atoms. Increased length and branching detract from activity. Certain alterations of the aromatic nuclei attached to the alpha N atom can be made without interfering with activity. A displacement of the pyridyl (Pyribenzamine, Neoantergan, Histadyl, Bromothen, Chlorothen) with the pyrimidyl group (Hetramine, Neohetramine) does not interfere appreciably with potency. The addition of a para-methoxyl group to the benzol nucleus enhances activity (Neoantergan versus Antergan; Neohetramine versus Hetramine). Furthermore, the benzol group may be converted to a thenyl (Histadyl or Thenylene) or halogenated thenyl group (Bromothen, Chlorothen) without impairing effectiveness.[48, 51]

The structural formulae of Trimetron, Antistine, Phenergan and Thephorin (Figure 3) vary in different degrees from the two large groups of compounds already discussed. There is great similarity in structure between Trimeton and Pyribenzamine and Benadryl but in the former substance a methane grouping has been substituted for the O atom of Benadryl and the alpha N atom of Pyribenzamine. In Antistine the terminal N atom has become a part of a heterocyclic compound. Phenergan has a phenothiozine molecule and an isopropyl group connecting the two N atoms. Thephorin is completely unlike any of the compounds. All of these antihistaminics, regardless of structure, possess clinical activity of a comparable degree, as will be pointed out later in this discussion.

IN VITRO EXPERIMENTS

Dale experiments. Ineluctable deceptions and unavoidable inaccuracies accrue from experiments with the Dale technique because of the erratic behavior of the isolated intestine.[16, 45] Because of this and the slight variations in technique employed by different investigators, precautions and heedfulness must be exercised in evaluating small differences in effectiveness of compounds tested.

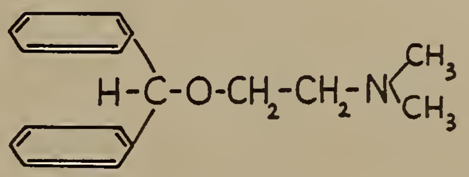
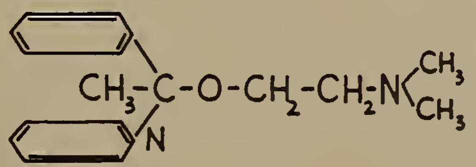
By exercising conservatism, certain conclusions can be drawn, even despite the hazards offered by this technique. Histadyl,[45, 48] Chlorothen,[45, 51] Bromothen,[45, 51] Pyribenzamine[45] and Neoantergan[45, 75, 90] are more potent than Phenergan[45, 31] and Benadryl;[45, 75, 29] and Antistine[45, 29] is the least potent of all.

IN VIVO EXPERIMENTS

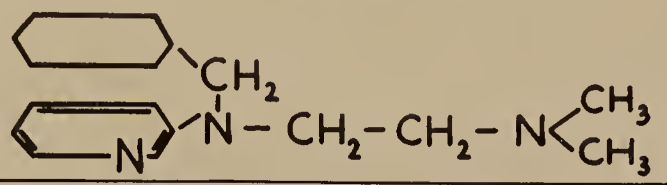
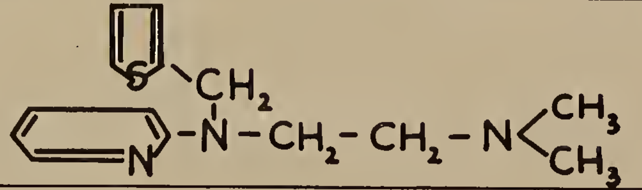
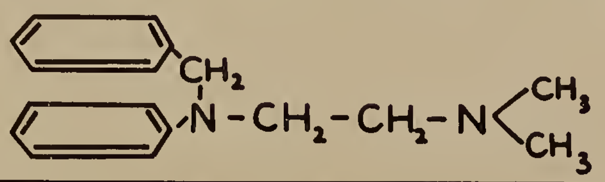
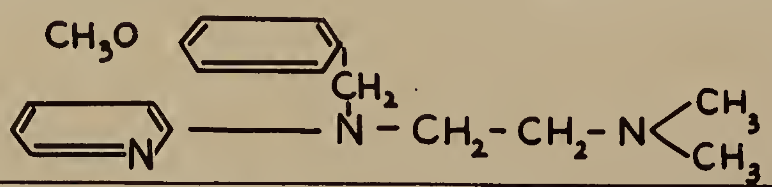
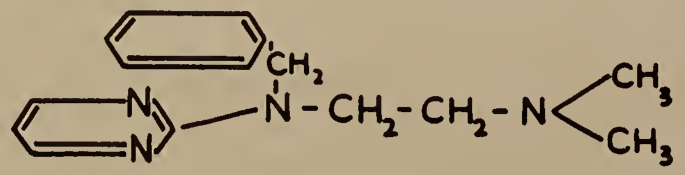
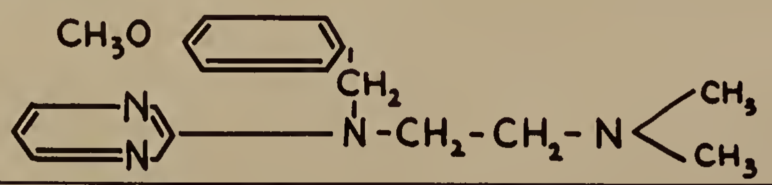
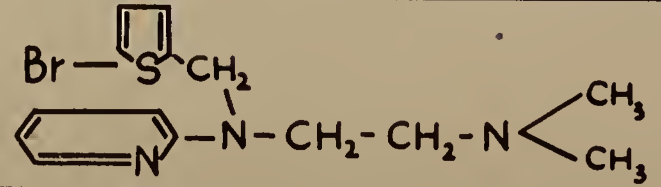
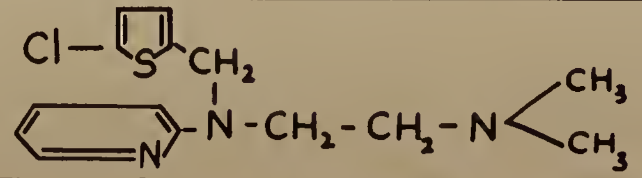
Histamine intoxication. Three methods have been used to study the blocking effect of antihistaminics in the intact guinea pig: (1) the injection of a fixed dose of antihistamine substance prior to the intravenous administration of histamine in order to ascertain the number of lethal doses of histamine that can be tolerated.[32, 33] (2) the administration of antihistaminics by injection or by mouth and noting the protection against histamine aerosol,[90, 33, 55] and (3) the determination of the smallest amount of antihistamine substances that will afford protection against one lethal dose of histamine injected intravenously,[90] intracardially[46] or intraperitoneally.[71, 21]

Slight differences in the comparative effectiveness of the various antihistaminics, due to the diversity of methods and procedures, are insignificant. However, it is noteworthy that whenever Neoantergan has been compared with other antihistaminics, regardless of technique employed for testing, it has

COMPOUNDS WITH Ethanolamine AS A BASIC UNIT

COMMON NAME	CHEMICAL NAME	FORMULA
Benadryl	β-dimethylaminoethyl benzhydryl ether.	
Decapryn	Dimethylaminoethoxymethylbenzylpyridine.	

COMPOUNDS WITH Ethylenediamine AS A BASIC UNIT

COMMON NAME	CHEMICAL NAME	FORMULA
Pyribenzamine	N′-pyridyl-N′-benzyl-N-dimethylethylenediamine.	
Histadyl OR Thenylene	N′-pyridyl-N′-thenyl-N-dimethylethylenediamine.	
Antergan	N′-phenyl-N′-benzyl-N-dimethylethylenediamine.	
Neoantergan	N′-*p*-methoxybenzyl-N′-pyridyl-N-dimethylethylenediamine.	
Hetramine	N′-benzyl-N′-2-pyrimidyl-N-dimethylethylenediamine.	
Neohetramine	N′-*p*-methoxylbenzyl-N′-2-pyrimidyl-N-dimethylethylenediamine.	
Bromothen	N′-pyridyl-N′-5-bromothenyl-N-dimethylethylenediamine.	
Chlorothen	N′-pyridyl-N′-5-chlorothenyl-N-dimethylethylenediamine.	

always proven to be the most effective,[90, 29, 46] with Pyribenzamine,[51, 90, 46] Histadyl,[46, 21] Bromothen,[46] Chlorothen,[46] Benadryl,[90, 29, 46, 21] Phenergan,[46] Hetramine,[90] and Antistine[29, 46] usually rated in regard to comparative potency in the order enumerated.

There is, therefore, a remarkable conformity in regard to the order of potency of the various antihistaminic compounds as determined by the Dale technique and by the in vivo experiments in the intact guinea pig when testing for activity against histamine intoxication.

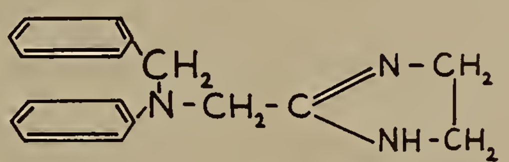
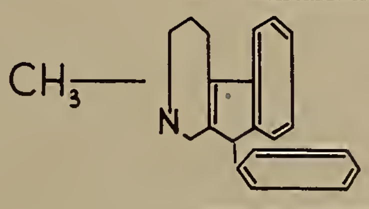
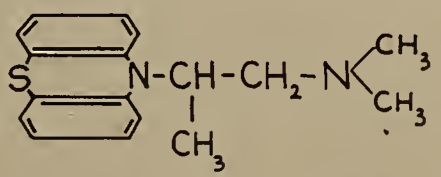
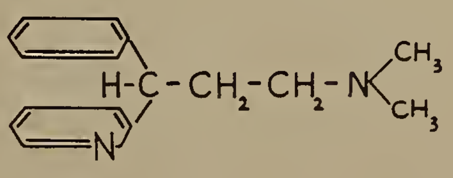
Animal anaphylaxis. Guinea pigs have been employed by most investigators for anaphylaxis experiments, and a great variety of foreign proteins have been used as sensitizing antigens. The usual procedure has been to administer the sensitizing dose of antigen; wait 14 to 21 days for hypersensitivity to develop; administer the antihistaminic substance, and then within 10 to 60 minutes thereafter give the challenging dose of antigen. By this method of investigation, Neoantergan,[46, 71] Antergan,[71] Pyribenzamine,[46, 71, 4, 54, 67] Histadyl,[46] Bromothen,[46] Chlorothen,[46] Thephorin,[49] Neohetramine,[67] Benadryl,[46, 71, 54, 76] Hetramine,[22] Phenergan[31, 46] and Antistine[46] have been shown to be potent. Very few investigators have studied the comparative effectiveness of many different compounds. However, Landau and co-workers,[46] studying nine compounds, found that the amounts of Neoantergan, Pyribenzamine, Histadyl, Bromothen, Chlorothen, Benadryl, 1721 (Searle), and Phenergan needed for protection were almost equal, and that larger doses of Antistine were required to similarly protect animals. Rose and co-workers[23] reported that Neoantergan, Pyribenzamine, Antergan and Benadryl were equivalent in protective power.

For protection against anaphylactic shock much higher doses of antihistaminics are required than for protection against histamine intoxication.[46] Because of this discrepancy it is not necessary to imply that anaphylaxis in the guinea pig is not the result of histamine release. It is probable that there is intracellular release of histamine as a result of antigen-antibody reaction.[28] Because of this, the opportunity for effectiveness of a blocking substance is less than it would be if the histamine came to the cells by way of the bloodstream. It is, therefore, intelligible why reactions to histamine which depend upon diffusion of histamine into tissues from the bloodstream can be more competently blocked by antihistaminics than can those reactions which result from release of histamine directly within the effector cells.

CLINICAL OBSERVATIONS

General. There are very few data available on the stability of antihistaminic substances. Trimeton discolors slowly on exposure to sunlight and reacts

MISCELLANEOUS COMPOUNDS

COMMON NAME	CHEMICAL NAME	FORMULA
Antistine	N'-phenyl-N'-benzyl aminomethylimidazoline.	
Thephorin	2-Methyl-9-phenyl-2 3.4.9-tetrahydro-1-pyridindene.	
Phenergan	N-dimethylaminoisopropylthiodiphenylamine.	
Trimeton	2-pyridyl B-N,N,-dimethylaminoethylmethane.	

with rubber.[74] Landau and Gay[45] reported that Phenergan had oxidized en route from France to their laboratories and that the potency of high dilutions of several drugs decreased even though they were refrigerated. They did not enumerate the drugs so affected.

The dearth of data on absorption and excretion is regrettable. Following the administration of 400 mg. of Benadryl in 50 cc. of water by mouth under fasting conditions, the concentration of Benadryl in the blood reaches a peak of 1.07 ug. per cc. within a period of 90 to 120 minutes. Under similar circumstances Pyribenzamine attains a peak of concentration of only 0.4 ug. per cc. after 180 minutes. Twenty-four hours after 400 mg. of Benadryl and Pyribenzamine were administered orally, 46 per cent and 20 per cent, respectively, were excreted in the urine.[56]

Benadryl administered orally in therapeutic doses has no effect on the body temperature, the basal metabolic rate, the body weight, the pulse rate, the blood cell structure, the electrocardiogram, or the glucose tolerance curves.[57, 58, 68] There may be a decrease in the blood pressure which persists for one to two hours following the oral administration of 50 to 100 mg.[23] However, following the intravenous administration of 200 mg. and 300 mg. of Benadryl in 50 cc. of distilled water the systolic and diastolic blood pressure rises an average of 30 to 40 mm. and 20 to 30 mm. respectively. The pulse rate also increases 20 to 25 beats per minute. This cardiovascular reaction persists for about 60 minutes and then begins to subside.[53]

Pyribenzamine given orally in doses of 150 mg. a day has no effect on body weight, blood pressure, urine, urea blood nitrogen, liver function or blood cells.[44]

Neohetramine[17] in daily doses of 200 to 400 mg. and Thephorin[18] in a daily dose of 300 mg. by mouth do not affect blood cells, urine, blood pressure or electrocardiogram of normal individuals. Inversion of the T waves in Lead C V_4 in patients with arteriosclerotic heart disease has been observed following the oral administration of 300 mg. of Thephorin. The changes disappeared after withdrawal of the drug.[18]

Electroencephalograms following the administration of 200 mg. doses of either Benadryl, Pyribenzamine, Neohetramine or Thephorin show identical changes of fast activity superimposed on a normal alpha rhythm. There may also be a decrease in the amplitude of the waves.[18]

Seasonal and perennial allergic rhinitis. The therapeutic effectiveness of antihistaminic drugs is not modified by the type of antigen setting off the hypersensitive reaction in the nose. The symptoms of sneezing, rhinorrhea, lacrimation, and itching of the eyes and nose are better relieved than is nasal congestion.[27] Pyribenzamine,[27, 8, 37, 52, 2, 89] Hydryllin,[27, 2] Antistine.[27, 2, 24, 88] Neoantergan,[27, 8, 2, 89, 88, 78] Histadyl,[21, 27, 63, 25] Benadryl,[27, 8, 52, 9] Thephorin,[18, 70] Neohetramine,[17, 2, 88, 7] Chlorothen,[27] Decapryn,[14, 76] and Trimeton[88, 13, 91] give beneficial results in from 60 to 80 per cent of the patients treated. The degree of relief depends upon the dosage employed and the patient's tolerance of the drug. Although Pyribenzamine, when it has been compared with other substances, has proved to be superior in effectiveness,[27, 8, 37, 2] this difference is not great and it is imperative to stress that any one compound is not generally superior to all others. It is not an uncommon experience to find patients that will benefit from one drug but not another, so that if symptomatic relief is not forthcoming during treatment with a particular antihistaminic substance, other compounds should be given a trial.

The oral dose for all compounds is similar. At the onset of treatment a small dose (25 to 50 mg.) administered regularly after each meal and at bedtime, or periodically as necessary to relieve symptoms, is advisable. The dose may be increased until relief is obtained or until side-effects are experienced. Larger amounts of Antistine[27] and Neohetramine[7] than of other antihistaminics are necessary to provide comparable relief.

The topical application of two to three drops of a 0.5 per cent solution of Pyribenzamine in the nose every three to four hours gives symptomatic relief and reduces the engorgement of the inferior turbinates. The duration of relief varies from one to 24 hours depending upon the severity of the symptoms. Local reactions such as burning in the nose and pharynx and sneezing occur, but general reactions have not been reported.[12] The topical application of one to two drops of a 0.5 per cent solution of Antistine in the eyes is usually non-irritating and often effective in the relief of the itching and the burning caused by the allergic reaction in the conjunctivae.[24]

The gratifying symptomatic relief afforded by the antihistaminic compounds must not diminish the search for etiological factors and must not encourage the withholding and exclusion of specific desensitization therapy. Desensitization with specific antigens as a therapeutic measure by itself is superior to symptomatic treatment with antihistaminic drugs. Furthermore, asthma is likely to develop in patients with allergic rhinitis during treatment with only antihistaminic substances, whereas, asthma rarely occurs in patients receiving perennial or preseasonal desensitization therapy. Desensitization and antihistaminic substances employed together provide the optimal opportunities for efficacious results.[89]

Bronchial asthma. Critical investigators have called attention to the poor results obtained in the treatment of bronchial asthma. About 25 to 50 per cent of the patients treated with Pyribenzamine,[27, 8, 37, 52, 2] Hydryllin,[27, 2] Antistine,[27, 24] Neoantergan,[27, 8, 2, 78] Histadyl,[27] Benadryl,[8, 52, 9] Thephorin,[18] Neohetramine,[17] Decapryn,[14, 76] and Trimeton[13, 91] are benefited. In a few instances where the effectiveness of several compounds has been compared, Hydryllin[27, 2] and Neoantergan[27] have met with the most success. But in the treatment of asthma as in the treatment of allergic rhinitis the differences in effectiveness of the various drugs are not of sufficient degree to merit dogmatism. Only patients with non-infective bronchial asthma presenting very mild symptoms are benefited. Patients with infective bronchial asthma are not affected favorably and it is probably not wise to attempt treatment of such patients with the antihistaminic compounds because of the drying effect.

Urticaria and angioneurotic edema. The antihistaminic drugs attain their zenith of effectiveness in acute urticaria and angioneurotic edema. Pyribenzamine,[27, 8, 37, 52, 5, 42, 1] Antistine,[27, 24, 61] Benadryl,[8,52,9,5,42,1] Histadyl,[27,42] Neoantergan,[27,39] Hydryllin,[27] Neohetramine,[17, 7] Thephorin,[18] Decapryn[14] and Trimeton[13] are of comparable effectiveness. From 60 to 90 per cent of patients treated receive varying degrees of subjective and objective relief. Pruritus is usually the first clinical manifestation to be ameliorated, and alleviation of erythema and edema follows. Pruritus may be promptly abated by the intravenous administration of from 20 to 50 mg. of Benadryl in 75 to 100 cc. of isotonic sodium chloride solution and this mitigation usually persists four to eight hours.[9] The author has procured more satisfactory and durable palliation by administering 100 mg. of Benadryl in 250 cc. of isotonic sodium chloride solution over a period of one to three hours and repeating the procedure as necessary throughout a 24-hour period. Only Benadryl and Histadyl are commercially available in solutions for parenteral injection. Chronic urticaria and angioneurotic edema respond less dramatically to antihistamine therapy than the acute forms.

Pruritic dermatosis other than urticaria and angioneurotic edema. The antihistaminic drugs do not alter the course of any skin disease other than by the indirect effect of reducing trauma through the amelioration of pruritus. An appraisal of the efficacy of such drugs in the relief of pruritus is made particularly untrustworthy because of the subjective nature of the symptom. Baer and co-workers[5] studied the effect of oral Benadryl and Pyribenzamine on patients with atopic dermatitis (disseminated neurodermatitis), eczematous dermatitis, erythema multiforme, chronic discoid and lichenoid dermatosis, acne vulgaris, psoriasis, lichen planus, pruritus vulvae and ani, generalized pruritus, lichen chronicus simplex and dermatitis medicamentosa. They concluded that only 10 per cent of their patients experienced commendable easement of itching. Other investigators employing Pyribenzamine,[8, 52] Benadryl,[8, 52] Neohetramine,[17] Thephorin,[18] and Trimeton[13] orally in the treatment of atopic dermatitis and contact dermatitis have reported disappointing results. The patch test reaction to poison ivy extract cannot be lessened by administering Pyribenzamine before, at the time of testing and during the development of the reaction.[84]

Antihistaminic substances have been incorporated in ointment bases for local application in the treatment of allergic cutaneous disorders and also other skin conditions that are accompanied by pruritus. A 5 per cent ointment of either Benadryl or Pyribenzamine is too irritating for general usage. The ointments available now for local application on the skin are all of a concentration of 2 per cent. Perry[65] could not reduce the erythema associated with a histaminic wheal by the local application of a 2 per cent Benadryl ointment, and was also unable to relieve pruritus in patients with itching dermatosis by the local application of such an ointment. Sulzberger and co-workers[82] have observed that 2 per cent and 5 per cent Pyribenzamine ointments have consistent effectiveness only in the local treatment of lichen chronicus simplex and that such ointments are of diminutive value in the management of atopic dermatitis, contact dermatitis and pruritus vulvae and ani.

A 5 per cent aqueous solution of Pyribenzamine filters out erythemogenic wave lengths (2,800 to 3,100 Å) and when introduced into the skin by iontophoresis inhibits ultraviolet erythema. That such an effect is not due to the antihistaminic qualities of Pyribenzamine is indicated by the evidence that Benadryl, which has a different absorption spectrum, does not inhibit ultraviolet erythema, and that Pyribenzamine solution interposed between the light source and the skin but not on or in the skin filters out the erythemogenic rays.[43]

Migraine. There has been a remarkable paucity of reported observations on the effects of antihistaminics in the treatment of migraine.[17, 18, 9, 70, 13] The number of patients treated with various compounds, as reported to date, is so insignificant that no conclusions can be drawn.

Tuberculosis. It has been assumed that the inflammatory reaction that occurs in reinfection with tubercle bacilli or from a spread from the primary focus is partially due to the release of histamine. If this actually is the case, antihistaminic drugs might prevent tissue destruction by protecting sensitized cells from injury. Neohetramine, Pyribenzamine, Benadryl and Thephorin have been employed in doses of 150 to 400 mg. daily in the treatment of patients with pulmonary tuberculosis over a period of ten weeks to seven months.[41] Of six patients with acute exudative tuberculosis and two patients with acute tuberculous pneumonia, seven displayed x-ray evidence of clearing of the pulmonary lesion, decrease in the amount of sputum and reduction of cough. In six of the patients the first strength purified protein derivative (P.P.D.) Mantoux test reverted from positive to negative. Only four out of 14 patients with mixed exudative and productive tuberculosis showed evidence of improvement on x-ray films, but the first strength P.P.D. test became negative in 11 of the patients. Of eight patients with productive tuberculosis none showed any evidence of improvement but seven of the eight patients developed negative reaction to first strength P.P.D. Mantoux test. The most significant and hopeful observation of this interesting study was the disclosure that when three patients with acute exudative tuberculosis who were improving were taken off antihis-

ANTIHISTAMINE SUBSTANCES AND THE FORMS IN WHICH THEY ARE COMPOUNDED

Common Name	Made Available by	FORMS OF PREPARATIONS MADE AVAILABLE FOR									
		ORAL ADMINISTRATION					Parenteral Administration	LOCAL ADMINISTRATION			
		Tablets containing	Capsules containing	Expectorant containing	Elixir containing	Syrup containing	Vials - Sterile	Ointment	Nasal Solution	Ophthalmic Solution	Ophthalmic Ointment
Benadryl*	Parke-Davis & Company		a. 25 mg. b. 50 mg.	10.6 mg. per 4 cc. with 1.6 gr. NH_4Cl	10 mg. per 4 cc.		10 cc. 1 cc. contains 10 mg.	2% (water soluble base)			
Hydryllin (combination of diphenhydramine* and aminophyllin)	G. D. Searle & Company	25 mg. of diphenhydramine 100 mg. of aminophyllin			12.5 mg. of diphenhydramine and 50 mg. of aminophyllin per 4 cc.						
Decapryn	Wm. S. Merrell Company	a. 12.5 mg. b. 25 mg. (scored)				6.25 mg. per 5 cc.					
Pyribenzamine	Ciba Pharmaceutical Products, Inc.	a. 50 mg. (scored) b. 50 mg. (delayed action coating)		30 mg. per 4 cc. with 10 mg. of ephedrine and 80 mg. of NH_4Cl	30 mg. per 4 cc.			a. 2% (petrolatum base) b. 2% (water soluble base)	0.5%		
Histadyl†	Eli Lilly & Company	50 mg. (delayed action coating)	a. 25 mg. b. 50 mg. c. 100 mg. d. 25 mg. (with ephedrine, 8 mg.)			16 mg. per 4 cc.	10 cc. 1 cc. contains 20 mg.	2% (water soluble base)	0.5%		0.5%
Methapyrilene†	The Maltine Company	a. 50 mg. (with ephedrine 16 mg. and sodium pentobarbital 16 mg.) b. 50 mg. (with ephedrine 16 mg. and sodium pentobarbital 16 mg. delayed action coating)									

Thenylene†	Abbott Laboratories	a. 25 mg. b. 50 mg. c. 100 mg. d. 25 mg. (with ephedrine 8 mg.) ‡ e. 50 mg. (with ephedrine 24 mg.) ‡						2%‡			
Neohetramine	Wyeth, Inc.	a. 25 mg. b. 50 mg. c. 100 mg.				25 mg. per 4 cc.		2%‡			
Neoantergan	Merck & Company, Inc.	a. 25 mg. b. 50 mg.				10 mg. per 4 cc.‡	1 cc. contains 10 mg.‡	5%‡			
Antistine	Ciba Pharmaceutical Products, Inc.	100 mg.							0.5%	0.5%	
Thephorin	Hoffmann-LaRoche, Inc.	25 mg.				10 mg. per 4 cc.		5% (water soluble base)			
Trimeton	Schering Corporation	25 mg. (scored)			7.5 mg. per 4 cc.			3%			
Dramamine (8-chlorotheophyllinate salt of diphenhydramine*)	G. D. Searle & Company	100 mg. (scored)									
Tagathen	Lederle Laboratories, Inc.	25 mg.									
Pyrrolazote	The Upjohn Company	a. 25 mg. b. 50 mg.									
Diatrin	Wm. R. Warner Company	50 mg.									
Chlor-Trimeton	Schering Corporation	4 mg. (scored)									
Perazil	Burroughs Wellcome & Co.	50 mg. (scored)									

---

* Identical compounds.

† Identical compounds.

‡ Compounds to be made available but not marketed at time article submitted for publication.

taminic therapy, x-ray evidence of retrogression in the pulmonary lesion developed. Furthermore, reinstitution of antihistaminic substances reproduced subjective and objective improvement.

In regard to the use of antihistaminic drugs in the treatment of infections a note of caution is sounded from the results of recent studies by Halpern in France. The edema accompanying local infections in animals produced by staphylococcus and Salmonella typhimurium was inhibited by treatment with Phenergan. The very act of preventing local edema by antihistaminics might very well destroy a natural barrier to the diffusion of the infection, because 80 per cent of the infected animals treated with antihistaminics developed septicemia and visceral abscesses and eventually died, whereas the infected animals that were not treated with antihistaminics recovered.[34]

Motion sickness. During the course of time that the clinical effects of Dramamine (B-dimethylaminoethyl benzohydryl ether 8-chlorotheophyllinate) on patients with hay fever and urticaria were being studied in the allergy clinic at the Johns Hopkins Hospital, it was by chance observed that the drug dramatically relieved motion sickness. Subsequent studies by Gay and Carliner which[26] were conducted on a United States Army transport carrying soldiers from New York to Bremerhaven, Germany, authenticated without a doubt the efficacy of this substance in the treatment and prevention of sea sickness. Dramamine in doses of 100 mg. every five hours and before retiring prevented sea sickness in all but two of 134 men. Furthermore, the drug effectively relieved the manifestations of sea sickness within one hour after it was administered. Strickland and Hahn[81] reported that the drug is also efficacious in the prevention of air sickness.

Miscellaneous conditions. Benadryl,[72, 60] Pyribenzamine[66] and Thephorin[70] reduce the severity and the duration of subjective and objective symptoms brought on by exposure to cold in individuals hypersensitive to cold. Neoantergan[40] and Benadryl[40] are effective in the management of patients hypersensitive to liver extract. Hunter[40] has advocated 1 gm. of Neoantergan, in divided doses, 24 hours prior to the administration of liver extract. At times it is advisable to give 300 mg. just prior to the injection. Severe reactions to liver extract, however, are not modified by Neoantergan. Carryer[15] recommends desensitization with liver extract in addition to the oral administration of 50 mg. of Benadryl three to four times a day. As the intervals between liver injections are increased Benadryl is given only on the days of the liver injections. Local reactions to insulin may be combated by mixing insulin with an equal amount of a 1:1,000 Benadryl solution. However, that procedure may need to be supplemented by Benadryl given orally if the local reaction is severe or if urticaria is a part of the reaction.[47] Horton and Brennan[38] were able to abort attacks of trigeminal neuralgia with 100 mg. of Pyribenzamine given orally. Attacks of trigeminal neuralgia could be precipitated by the injection of 0.1 mg. of histamine and immediately relieved by either 100 mg. of Pyribenzamine or 100 mg. of Benadryl administered orally. Thirty mg. of Benadryl in 100 cc. of isotonic sodium chloride solution injected intravenously also alleviated the attacks. Bernstein and co-workers[8] reported Benadryl to be effective in the management of two patients with cardiac asthma and in five of ten patients with functional dysmenorrhea. Trimeton[13] is reported to have been of excellent benefit to one patient and of moderate benefit to another patient with radiation sickness. Pyribenzamine[66] does not inhibit the increase of gastric acidity induced by the administration of histamine.

SIDE-EFFECTS

There is a definite correlation between the incidence of side-reactions and the size of the dose of antihistaminic drugs, but there is no relationship between the kind of side-reaction that develops and the dosage. Furthermore, there is an individuality of response for each patient as far as different compounds are concerned, and this applies to therapeutic effectiveness as well as to side-effects. With few exceptions the quality of the side-reactions is similar for all compounds. The quantity of side-effects reported varies according to the drugs and also according to duration of time that they have been available for study. The customary and common side-effects, irrespective of compound, are: Drowsiness, dizziness, weakness and fatigue, nervousness, tremor, faintness, headache, apprehension, mental confusion, dryness of oral cavity, nausea, anorexia, abdominal pain, vomiting, blurring of vision, paresthesia, tachycardia, palpitation, and urinary frequency.[27, 8, 1, 38] The incidence of side-effects in patients treated with antihistaminic compounds varies from 10 per cent for some of the compounds to 50 per cent for others. Reactions are more liable to accompany the usage of Benadryl, Pyribenzamine, Hydryllin and Neoantergan[27, 8, 52, 89] than Antistine, Histadyl, Neohetramine and Thephorin.[17, 18, 27, 24, 7] Trimeton[13, 91] and Decapryn[14] are infrequently followed by side-effects, but to date insufficient data have been recorded on these compounds to permit comparison with the other members of antihistaminic family. Thephorin is unique among the various compounds in that insomnia and nervousness,[18, 11, 59, 62] and not drowsiness, are the most frequent unfavorable reactions.

The toxic reactions to Benadryl have been reviewed by Sachs[73] and the reader is referred to this article if reactions are encountered which are not enumerated in this treatise. It is necessary, however, to take cognizance of the ill-imagined allergic reactions to these compounds. Bronchial asthma has been exacerbated by Benadryl[86, 87, 20, 50, 10] and Pyribenzamine.[37] Eczematoid dermatitis from Pyribenzamine,[3, 19, 36] and contact dermatitis from Pyribenzamine ointment[82, 79] have been encountered.

It is interesting to speculate as to why antihistaminics should enhance at times such clinical manifestations of hypersensitivity as bronchial asthma.

Is such a reaction the result of the drying effect of these drugs; is it the result of a true hypersensitivity to the chemical compounds; or is it a manifestation of Pellerat's so-called "histaminoid accident," which this investigator claims to be due to the release of histamine from the cell receptors by the antihistaminics? The questions cannot be answered at this time, but certainly the matter is worthy of diligent study.

In selecting an antihistaminic drug for the treatment of an allergic disorder it is as imperative to consider carefully the percentage of incidence of side-effects as it is the percentage of good results obtained. If it is desirable to avoid drowsiness, Antistine, Histadyl, Thenylene, Thephorin, Neohetramine and possibly Decapryn and Trimeton should be prescribed. When a sedative effect is indicated, Benadryl, Hydryllin, Pyribenzamine and possibly Neoantergan take precedence. Optimal results can usually be obtained by using combinations of the various compounds and changing from one to the other as the case demands. It is indeed fortunate that a choice can be made from several preparations, and that the preparations are compounded in a variety of forms (see chart).

239 Laurel Street.

REFERENCES

1. Arbesman, C. E.: The pharmacology, physiology, and clinical evaluation of the new antihistaminic drugs (Pyribenzamine and Benadryl), New York M. J., 47:1775, 1947.

2. Arbesman, C. E.: Comparative studies of several antihistaminic drugs, J. Allergy, 19:178, May 1948.

3. Arbesman, C. E., Koepf, G. F., and Lenzner, A. R.: Clinical studies with N'pyridyl, N'benzl, dimethylethylenediamine monohydrochloride (Pyribenzamine), J. Allergy, 17:275, Sept. 1946.

4. Arbesman, C. F., Koepf, G. F., and Miller, G. E.: Some antianaphylactic and antihistaminic properties of N'pyridyl, N'benzl, dimethylethylenediamine monohydrochloride (Pyribenzamine), J. Allergy, 17:203, July 1946.

5. Baer, R. L., Sulzberger, M. B., and Witten, V. H.: The treatment of itching dermatoses with antihistaminic drugs with particular reference to Pyribenzamine, Am. Pract., 2: 237, Dec. 1947.

6. Baur, H., and Staub, H.: Blood histamine after administration of sympathol, Helv. Physiol. et Pharmacol, 6:462, 1948.

7. Bernstein, T. B., and Feinberg, S. M.: Histamine antagonists. XII. Neohetramine, 2-(N-dimethylaminoethyl-N-P-methoxybenzl)-aminopyrimidine hydrochloride; clinic and pharmacologic results, J. Allergy, 19:393, Sept. 1948.

8. Bernstein, T. B., Rose, J. M., and Feinberg, S. M.: New antihistaminic drugs (Benadryl, Pyribenzamine and Neoantergan) in hay fever and other allergic conditions, Illinois M. J., 92:90, 1947.

9. Blumenthal, L. B., and Rosenberg, M. H.: Diphenylhydramine hydrochloride. Report on its use in 137 patients, J.A.M.A., 135:20, Sept. 1947.

10. Bowen, R.: Benadryl. Its therapeutic value in allergy, Texas State J. M., 42:188, 1946.

11. Boyd, L. J., Weissberg, J., and McGavack, T. H.: Tolerance studies of the antihistaminic drug thephorin, New York State M. J., 48:1596, 1948.

12. Brem, J., and Zonis, J.: Intranasal application of buffered tripelennamine (Pyribenzamine) solution in allergic rhinitis. A preliminary report, J. Allergy, 20:70, 1949.

13. Brown, E. A.: A clinical evaluation of a new antihistaminic agent, "Trimetron." A conjoint study of 227 patients, Ann. Allergy, 6:393, 1948.

14. Brown, E. A., Weiss, R., and Maher, J. P.: The clinical evaluation of a new histamine antagonist, "Decapryn," Ann. Allergy, 6:1, 1948.

15. Carryer, H. M., and Koetsche, G. A.: Use of antihistaminic drugs in treating patients allergic to liver extract, J. Allergy, 19:376, Nov. 1948.

16. Chen, G., Ensor, C. R., and Clark, J. G.: The biological assay of histamine and diphenhydramine hydrochloride (Benadryl Hydrochloride), J. Pharmacol. & Exper. Therap., 92:90, Jan. 1948.

17. Criep, L. H., and Aaron, T. H.: Neohetramine: An experimental and clinical evaluation in allergic states, J. Allergy, 19:215, July 1948.

18. Criep, L. H., and Aaron, T. H.: Thephorin: An experimental and clinical evaluation in allergic states, J. Allergy, 19:304, July 1948.

19. Epstein, E.: Dermatitis occurring during therapy with tripelennamine hydrochloride ("Pyribenzamine Hydrochloride"), J.A.M.A., 134:78, 1947.

20. Eyerman, C. H.: Clinical experiences with a new antihistaminic drug, J. Allergy, 17:210, July 1946.

21. Feinberg, S. M., and Bernstein, T. H.: Histamine antagonists. VIII. N-(a-pyridyl)-N-(a-thenyl)-N' N-dimethylethylenediamine. A new antihistamine compound. Experimental and clinical experiences, J. Lab. and Clin. Med., 32:1370, Nov. 1947.

22. Feinstone, W. H., Williams, R. D., and Rubin, B.: Antihistamine and antianaphylactic effect of Hetramine, new synthetic pyrimidine compound, Proc. Soc. Biol. Med., 63: 158, 1946.

23. Friedlaender, S., and Feinberg, S. M.: Histamine antagonists; effect of oral and local use of B-dimethylaminoethyl benzhydryl ether hydrochloride on whealing due to histamine, antigen-antibody reaction and other whealing mechanisms. Therapeutic results in allergic manifestations, J. Allergy, 17:129, March 1946.

24. Friedlaender, A. S., and Friedlaender, S.: An evaluation of Antistine. A new antihistaminic substance, Am. Allergy, 6:23, 1948.

25. Friedlaender, A. S., and Friedlaender, S.: Antihistaminic, antianaphylactic and antiallergic activity of N-(a-pyridyl)-N-(a-thenyl)-N', N'-dimethylethylenediamine hydrochloride, Am. J. M. Sc., 215:530, May 1948.

26. Gay, L. N., and Carliner, P. E.: The prevention and treatment of motion sickness. I. Sea sickness, Science, 109: 359, April 8, 1949.

27. Gay, L. N., Landau, S. W., Carliner, P. E., Davison, N. S., Furstenberg, F. F., Herman, N. B., Nelson, W. H., Parsons, J. W., and Winkenwerder, W. W.: Comparative study of antihistamine substances. III. Clinical observations, Bull. Johns Hopkins Hosp., 83:356, Oct. 1948.

28. Gilman, A.: The pharmacology of drugs used in allergic conditions, J. Allergy, 19:281, 1948.

29. Graham, J. D. P.: Comparison of some antihistaminic substances, J. Pharmacol. & Exper. Therap., 91:103, Oct. 1947.

30. Haley, J. J.: The antihistaminic drugs, J. Am. Pharm. Assoc., 37:383, 1948.

31. Halpern, B. N.: Experimental research on new series of chemical substances with antihistaminic and antianaphylactic activity. Derivatives of thiodiphenylamine, Bull. Soc. Chem. Biol., 29:309, 1947.

32. Halpern, B. N.: Experimental research on new series of chemical substances with powerful antihistaminic activity. Thiodiphenylamine derivatives, J. Allergy, 18:263, July 1947.

33. Halpern, B. N.: Experimental research on new series of chemical substances with antihistaminic and antianaphylactic activity. Derivatives of thiodiphenylamine, Arch. Internat. de Pharmacodyn. et de Therap., 68:339, 1942.

34. Halpern, B. N.: Foreign letters, J.A.M.A., 139:82, 1949.

35. Halpern, B. N., and Cruichaud, S.: Prevention of acute experimental edema of lungs by a synthetic antihistaminic derivative of thiodiphenylamine, Experientia, 4:34, 1948.

36. Harris, M. C., and Shure, N.: Eczematoid dermatitis following ingestion of "Pyribenzamine Hydrochloride," N. N. R. tablets, J. Allergy, 18:408, Nov. 1947.

37. Henderson, A. T., and Rose, B.: Pyribenzamine (N-pyridyl, N-benzyl, dimethylethylenediamine hydrochloride) in the treatment of allergy, Canad. M.A.J., 57:136, 1947.

38. Horton, C. E., and Brennan, A. J.: The use of antihistaminic drugs in the treatment of trigeminal neuralgia, J.A.M.A., 136:870, March 27, 1948.

39. Hunter, R. B.: Neoantergan in the treatment of urticaria, Lancet, 1:672, 1947.

40. Hunter, R. B., and Hill, A. G. S.: Anthisan in the management of liver and insulin sensitivity, Lancet, 2:383, 1947.

41. Judd, A. R., and Henderson, A. R.: The use of antihistaminics in human tuberculosis, In Press.

42. Kierland, R. R., and Pitter, R. T.: An evaluation of thenylene (N, N-dimethyl-N-(alpha-pyridyl)-N' (alpha-thenyl) ethylenediamine hydrochloride), Proc. Staff Meet. Mayo Clin., 23:48, Jan. 21, 1948.

43. Kline, P. R., and Baer, R. L.: Nature of inhibition of ultraviolet erythema by pyribenzamine, J. Invest. Dermat., 10:397, June 1948.

44. Koepf, G. F., Arbesman, C. E. and Munafo, C.: Chronic toxicity of N'pyridyl, N-benzl, dimethylethylenediamine monohydrochloride (Pyribenzamine), J. Allergy, 17:271, Sept. 1946.

45. Landau, S. W., and Gay, L. N.: Comparative study of antihistamine substances. I. Introduction and Dale experiments, Bull. Johns Hopkins Hosp., 83:330, Oct. 1948.

46. Landau, S. W., Marriott, H. J. L., and Gay, L. N.: Comparative study of antihistamine substances. II. Activity in vivo against histamine intoxication and anaphylactic shock in guinea pigs, Bull. Johns Hopkins Hosp., 83:343, Oct. 1948.

47. Leavitt, M. D., and Gastineau, C. F.: Treatment of allergy to insulin with diphenhydramine hydrochloride. Report of two cases, Arch. Int. Med., 80:271, Aug. 1947.

48. Lee, H. M., Dinwiddie, W. C., and Chen, K. K.: The antihistamine action of N-(2-pyridyl)-N-(2-thenyl)-N: N'dimethylethylenediamine hydrochloride, J. Pharmacol. & Exper. Therap., 90:83, May 1947.

49. Lehmann, G., Hogan, E., Barbarow, G., and Roe, M.: The antihistamine action of pyridindene derivatives, Federation Proc., 6:350, March, Part II, 1947.

50. Levin, S. J.: B-dimethylaminoethyl benzhydryl ether hydrochloride (Benadryl). Its use in allergic diseases, J. Allergy, 17:145, May 1946.

51. Litchfield, J. T., Jr., Adams, M. R., Goddard, L., Jaeger, M. S., and Alonzo, L.: 5-Halo-2-thenyl derivatives of N, N-dimethyl-N'-2-pyridylethylenediamine as antihistaminics, Bull. Johns Hopkins Hosp., 81:55, July 1947.

52. Loveless, M. H., and Brown, N.: Comparison between the clinical effects of Pyribenzamine and those of Benadryl, New England J. Med., 237:501, 1947.

53. Mackmull, G.: The influence of intravenously administered Benadryl on blood pressure and electrocardiogram, J. Allergy, 19:365, Nov. 1948.

54. Marcus, S.: Quantitative aspects of inhibition of anaphylactic shock in guinea pigs, Proc. Soc. Exper. Biol. Med., 66:181, 1947.

55. Mayer, R. L.: Antihistaminic substances with special reference to Pyribenzamine, J. Allergy, 17:153, May 1946.

56. McGavack, T. H., Drekter, I. J., Schutzer, S., and Heisler, A.: Levels for Pyribenzamine and Benadryl in blood and urine following a single orally administered dose, J. Allergy, 19:251, July 1948.

57. McGavack, T. H., Elias, H., and Boyd, L. J.: The influence of dimethylaminoethyl benzhydryl ether hydrochloride (Benadryl) upon normal persons and upon those suffering from disturbances of the autonomic nervous system, J. Lab. Clin. Med., 31:560, May 1946.

58. McGavack, T. H., Elias, N., and Boyd, L. J.: Some pharmacological and clinical experiences with dimethylaminoethyl benzhydryl ether hydrochloride (Benadryl). Am. J. Med. Sci., 213:418, April 1947.

59. Monchek, M.: Clinical experiences with a new antihistaminic drug—Thephorin, Journal-Lancet, 68:428, 1948.

60. Mullinger, M. A., and Bogoch, A.: Cold hypersensitivity, Canad. M.A.J., 58:499, 1948.

61. Overton, J.: "Antistine" in dermatology, Brit. M. J., 4557:874, 1948.

62. Paul, A. B., Eggston, A. A., Garofalo, C. J., and Bellucei, R. J.: Clinical evaluation of a new antihistaminic compound, Laryngoscope, 58:1044, 1948.

63. Peirce, J. D., and Mothersill, M. N.: Treatment of allergic symptoms with a new histaminic drug, J. Indiana M. A., 40:739, 1947.

64. Pellerat, J.: Thesis (Lyon 1945) and Congres. Med. francais, Oct. 1947.

65. Perry, D. J.: The local use of benadryl ointment, J. Invest. Dermat., 9:95, Aug. 1947.

66. Perry, E. L., and Horton, B. T.: The use of pyribenzamine in prevention of histamine induced gastric acidity and headaches and in the treatment of hypersensitiveness to cold, Am. J. M. Sc., 214:553, Nov. 1947.

67. Reinhard, J. F., and Scudi, J. V.: Pharmacological characteristics of Neohetramine, a new antihistaminic drug. Proc. Soc. Exper. Biol. Med., 66:512, Dec. 1947.

68. Reinstein, H., and McGavack, T. H.: Nature of Benadryl activity; glucose tolerance curves, J. Clin. Endocrinol., 6:479, June 1946.

69. Reuse, J. J.: The protective action of Phenergan on death in rabbits from adrenaline, Compt. Rend. Soc. de Biol., 142:638, 1948.

70. Reynolds, J. L., and Horton, B. T.: Clinical observations on the use of Thephorin (NU-1504), Proc. Staff Meet., Mayo Clin., 22:574, Dec. 10, 1947.

71. Rose, J. M., Feinberg, A. R., Friedlaender, S.. and Feinberg, S. M.: Histamine antagonists; comparative antianaphylactic activity of some new antihistaminic drugs, J. Allergy, 18:149, May 1947.

72. Rothschild, J. E.: Effects of Benadryl on systemic manifestations of cold hypersensitivity, J. Allergy, 20:62, 1949.

73. Sachs, B. A.: The toxicity of Benadryl: Report of a case and review of the literature, Ann. Int. Med., 29:135, July 1948.

74. Schering Corporation brochure on Trimeton.

75. Schild, H. O.: pA, new scale for measurement of drug antagonism, Brit. J. Pharmacol. Exper. Therap., 2:189, 1947.

76. Selle, W. A.: Beta dimethylamino-ethyl benzhydryl ether hydrochloride as an antihistaminic and antianaphylactic agent, Federation Proc., 5:93, Feb., Part II, 1946.

77. Sheldon, J. M., Weller, K. E., Haley, R. R., and Fulton, J. K.: Clinical observations with Decapryn. A new antihistaminic compound, Uni. Mich. Hosp. Bull., 14:13, 1948.

78. Southwell, N.: "Anthisan" in treatment of asthma and hay fever, Brit. M. J., 4557:877, 1948.

79. Staub, H., and Baur, H.: Sympathol-histaminemia in neuro-vegetative disorders, Schweiz. Med. Wochschr., 78:1249, 1948.

80. Strauss, M. J.: Eczematous contact type allergy to pyribenzamine, J. Invest. Dermat., 11:155, Sept. 1948.

81. Strickland, B. A., and Hahn, G. L.: The effectiveness of dramamine in the prevention of air sickness, Science. 109:359, April 8, 1949.

82. Sulzberger, M. D., Baer, R. L., and Levin, N. B.: Local therapy with pyribenzamine hydrochloride, J. Invest. Dermat., 10:41, Feb. 1948.

83. Surkes, A. W.: Blood histamine after intravenous adrenaline injection in allergic and neuro-vegetative disorders, Schweiz. Med. Wochschr., 78:662, 1948.

84. Tweedall, D. C., and O'Connor, W. B.: Pyribenzamine in therapy and prophylaxis of rhus dermatitis, J. Invest. Dermat., 10:301, May 1948.

85. Vargas, J. Jimenez, and Farrerons-Co., F. J.: Histaminemia in various conditions of physiological vasoconstriction, Rev. Espan. fisiol., 3:249, 1947.

86. Waldbott, G. L.: Clinical results with benadryl, J. Allergy, 17:142, May 1946.

87. Waldbott, G. L.: New antihistaminic drugs in allergic diseases, J. Mich. M. Soc., 45:1051, 1946.

88. Waldbott, G. L., and Young, M. I.: Antistine, Neoantergan, Neohetramine, Trimeton, Antihistaminique R. P. 3277—an appraisal of their clinical value, J. Allergy, 19: 313, Sept. 1948.

89. Weiss, W. I., and Howard, R. M.: Antihistaminic drugs in hay fever. A comparative study with other therapeutic methods, J. Allergy, 19:271, July 1948.

90. Winter, C. A.: Study of comparative antihistaminic activity of six compounds, J. Pharmacol. & Exper. Therap., 90:224, July 1947.

91. Wittick, F. W.: Trimeton in the treatment of allergic diseases, Ann. Allergy, 6:497, 1948.

92. Yonkman, F. F., and Mohr, F. L.: An approach to the problem of epinephrine-fastness. Ann. Allergy. 7:60, 1949.

* * *

CASE REPORTS

- Fatal Acute Agranulocytosis Following Prolonged Administration of Small Doses of Sulfadiazine for Urinary Bacteriostasis
- Congenital Absence of the Gallbladder

Fatal Acute Agranulocytosis Following Prolonged Administration of Small Doses of Sulfadiazine for Urinary Bacteriostasis

Matthew Marshall, Jr., M.D., Thaddeus M. McNamara, Jr., M.D., and John W. Schulte, M.D., *San Francisco*

ADDIS[1] suggested the use of 400 mg. of sulfathiazole daily to produce bacteriostasis in the urine as an adjunct in the treatment of chronic pyelonephritis. On this basis, the authors have used 500 mg. of sulfadiazine daily following prostatectomy as a prophylaxis against acute urinary infection. The following case report suggests that fatal acute agranulocytosis may result from such small doses of sulfadiazine. The patient received 2 gm. of sulfadiazine daily for six days, followed by 0.5 gm. of sulfadiazine daily for 34 days. The total dose was 29 gm. administered over a 40-day period. Acute agranulocytosis developed and the drug was discontinued. Other drugs given were codeine, acetylsalicylic acid, thiamine and penicillin. With the possible exception of penicillin, these drugs are not thought to cause acute agranulocytosis. However, sulfathiazole and sulfadiazine are known to cause acute agranulocytosis. Periods of granulocytopenia develop frequently in patients who are taking a sulfonamide, but usually recovery occurs. Usually, acute agranulocytosis caused by a sulfonamide occurs only if the daily doses are larger than those given in the case here reported and are administered over a period of two weeks or more, or if the drug is administered intravenously. One non-fatal case, however, has been reported following one week of sulfonamide therapy.

CASE REPORT

A 75-year-old white male entered San Francisco Hospital on September 27, 1948, complaining of increasing nocturia, dysuria, and slowing of the flow of urine since 1946. There were no other urinary symptoms and a systemic review revealed nothing suggesting concurrent disease. As a youth, the patient had had gonorrhea and typhoid fever. He had taken no drugs prior to admission and had never taken a sulfonamide. There was no familial history suggestive of blood dyscrasia.

The patient was moderately obese, cooperative and comfortable. The temperature was 98°F., the pulse rate 80, respirations 20 and blood pressure 140 mm. of mercury systolic and 80 mm. diastolic. No significant abnormalities were noted upon general examination except mild generalized arteriosclerosis, small varicosities on both calves, and enlargement of the prostate to about four times normal size. The prostate was smooth, firm, and not fixed. Residual urine measured 325 cc.

Hemoglobin was 13 gm. per 100 cc. of whole blood, and leukocytes numbered 5,200 with 72 per cent neutrophils, 2 per cent eosinophils, 24 per cent lymphocytes and 2 per cent monocytes. The urine contained no albumin or sugar. An occasional leukocyte was noted in the centrifuged sediment of the urine; no bacteria were seen on the stained smear. Phenolsulfonephthalein was excreted to the extent of 25 per cent in the first half hour and 55 per cent in two hours.

In a cystoscopic examination the prostate was noted to be trilobate and symmetrically hypertrophied; the bladder was trabeculated. Sulfadiazine, 0.5 gm. four times a day, was started September 30. On October 1, suprapubic prostatectomy for benign adenoma was performed without difficulty. A suprapubic tube and a Foley type urethral catheter were left indwelling. The postoperative course was uneventful, except for a low grade fever, until the evening of October 4 when the patient became confused and removed the inflated Foley urethral catheter. No hemorrhage ensued. On October 6, the dose of sulfadiazine was reduced to 0.25 gm. twice a day. On this day, the hemoglobin content of the blood was 14 gm. per 100 cc. and leukocytes numbered 5,600. On October 7, a urethral catheter was reinserted without difficulty and the suprapubic tube removed. The urethral catheter was left indwelling until October 24 since some suprapubic leakage continued. On October 20, phenolsulfonephthalein was excreted to the extent of 25 per cent in the first half hour and totaled 60 per cent in two hours.

The postoperative course was again uncomplicated until October 26 when the patient complained of pain in the chest and cough. The temperature was 100°F., pulse rate 120 and respiration rate 26. A dull percussion note, decreased breath sounds and crepitant rales were found in the region of the chest overlying the left lower lobe of the lung. Leukocytes numbered 13,300 with 67 per cent neutrophils, 1 per cent basophils and 32 per cent lymphocytes. There was no growth on a culture of blood. A roentgenogram of the chest showed consolidation in the left lower lobe. The patient was given Crysticillin® (procaine penicillin G), 300,000 units daily, for eight consecutive days. Sulfadiazine, 0.5 gm. daily, was continued. On October 28, the leukocyte count was 8,600 with 74 per cent neutrophils, 2 per cent eosinophils, 22 per cent lymphocytes and 2 per cent monocytes. By October 30, the temperature had returned to normal and the patient was clinically improved.

The course was then uneventful until November 9 when the patient complained of shortness of breath, excessive sweating and pain in the left chest anteriorly. The temperature was 103, the pulse rate 130 and the respiration rate 28. The patient appeared acutely ill and dyspneic. There was profuse diaphoresis. No ulcerations on the mucous membranes of the mouth were seen but the breath was offensive and the tongue dry. The skin showed no hemorrhagic phenomena. The hemoglobin content of the blood was 12 gm. per 100 cc.; leukocytes numbered 1,700 with no granulocytes and 100 per cent lymphocytes and monocytes. The urine contained no albumin or sugar; occasional leukocytes were present in the centrifuged sediment. No bacteria were noted on a stained smear of urine. Blood cultures produced E.

From the Department of Surgery, Division of Urology, the University of California.

coli on two occasions. A roentgenogram of the chest showed both lung fields to be clear. Sulfadiazine was discontinued. The patient was given Crysticillin,® 300,000 units twice a day. Intravenous infusions of glucose, saline and whole blood were given. Intranasal oxygen was administered. On November 11, the patient was so dyspneic he had difficulty in speaking. The temperature was 105, the pulse rate 140 and the respiration rate 45. No hemorrhagic or ulcerative mucosal or cutaneous lesions were observed. Leukocytes numbered 1,070 and all the cells were lymphocytes or monocytes. The arm-to-tongue circulation time was approximately 10 seconds. Crysticillin® was discontinued and 100,000 units of penicillin was given parenterally every three hours, streptomycin 1 gm. every six hours and folic acid 50 mg. three times a day. Supportive therapy was continued. However, the fever, tachycardia and dyspnea did not subside and the patient became comatose. On November 13, 1948, the 43rd postoperative day, leukocytes numbered 150 and no granulocytes were observed. The patient died. Permission for autopsy was refused. Clinically, death appeared to have been caused by acute agranulocytosis.

SUMMARY AND CONCLUSIONS

A case in which the patient died, apparently of acute agranulocytosis, following the administration of 29 gm. of sulfadiazine over a 40-day period is presented.

It is suggested that even small daily doses of sulfadiazine be administered cautiously.

REFERENCES

1. Addis, T.: Glomerular Nephritis, Macmillan Co., 1948, p. 176.

2. Allen, R. L., and Jackson, J. F.: Acute agranulocytosis caused by sulfathiazole in a Negro with recovery of the patient, Med. Bul. Vet. Admin., 19:460-462, April 1943.

3. Kracke, R. R.: Effect of sulfonamide drugs on blood, Am. J. Clin. Path., 14:191-199, April 1944.

4. Plummer, N., and Wheeler, C.: Toxicity of sulfadiazine. Observation on 1,357 cases, Am. J. Med. Sci., 207:175-184, Feb. 1944.

5. Spain, D. M., and Clark, T. B.: Agranulocytosis during penicillin therapy, Ann. Int. Med., 25:732, Oct. 1946.

Congenital Absence of the Gallbladder

Case Report

Walter E. Sharpe, Jr., M.D., *Los Angeles*

CONGENITAL absence of the gallbladder is an infrequently reported finding at operation. Dixon and Licthman reported on 60 cases, ten of which were observed at the Mayo Clinic since 1900. In 24 cases the condition was noted at operation and in the remainder at autopsy.

CASE REPORT

The patient was a 62-year-old white female who complained of severe right subcostal pain of a few hours' duration, accompanied by nausea and vomiting. For 25 years she had been troubled with fatty food intolerance and vague abdominal discomfort. Sleeping on the right side was usually uncomfortable, and the patient had been troubled much with gastric flatulence. During the preceding five or six years she had had attacks of pain similar to the present one, followed shortly by mild jaundice of one to five days' duration. Cholecystograms three years previously had not revealed a gallbladder shadow. No abdominal operations had been performed.

Physical examination: The patient was 61 inches in height and she weighed 170 pounds. Blood pressure was 115 mm. of mercury systolic and 85 mm. diastolic. There was slight icteric tint to the sclerae and the appearance of the skin suggested jaundice. In the right upper quadrant of the abdomen there was moderate tenderness well localized to the gallbladder area, without muscle protection.

A large incarcerated left inguinal hernia and huge varicose veins in both legs were noted.

Clinical jaundice developed subsequently and rapidly decreased during the preoperative period.

Laboratory findings: Erythrocytes numbered 4,450,000 and the hemoglobin content was 13.8 gm. per 100 cc. Leukocytes numbered 8,600 with 79 per cent neutrophils. Results of urinalysis were normal. The icteric index was 56 units the second day, 27 units on the third. The reaction to a Van den Bergh test by the indirect method was 3.6; by the direct method, 1.4. Bromsulfalein retention was 43 per cent at 30 minutes. Prothrombin time was 80 per cent of normal. Urobilinogen was present in the urine in dilution of 1:40. Feces were faintly positive for urobilin. The blood sugar was 145 mg. per 100 cc. Results of Kahn and Mazzini tests of the blood were negative. Total protein content in the blood was 4.3 gm. per 100 cc.

The usual liver supportive treatment with vitamin K was given, and six days after admission the patient was operated upon. The preoperative diagnosis was choledocholithiasis, cholelithiasis, and chronic cholecystitis. A right upper paramedian incision was used. There were multiple dense adhesions in the gallbladder area attaching the duodenum and omentum to the liver. The liver was slightly nodular but of normal consistency. There was a moderate-sized, fairly firm enlargement at the head of the pancreas which was interpreted as chronic inflammation. The gallbladder could not be found nor could its fossa be located. The common bile duct was dilated to about 4 cm. at the largest portion, and there was enlargement of both hepatic ducts. The ducts were filled with multiple soft stones and much putty-like material. In the ampulla of Vater was an impacted stone. The hepatic ducts and common duct were traced from the liver entrances to the duodenal opening but no trace or remnant of the gallbladder or cystic duct was found.

The common duct was opened and all the stones that could be reached were scooped out. The ducts were then irrigated to remove as much as possible of the great quantity of gravel they contained. Opposite the ampulla the duodenum was opened and the papilla incised in order to remove the impacted stone. The duodenum was closed transversely and a long T-tube was placed in the common duct and extended into the duodenum.

Postoperatively the T-tube became dislodged before cholangiograms could be obtained.

When last observed nine months later, the patient was in good condition.

COMMENT

The anatomical findings in this case were baffling. There were many adhesions and when the common duct was palpated it was first thought to be the gallbladder in an unusual location. It is realized that the possibility of an intrahepatic gallbladder should be considered and that a postoperative cholangiogram was desirable. However, since the ducts were well visualized, it is felt that this was a case of congenital absence of the gallbladder.

It is interesting to note how closely the symptoms simulated those of cholecystic disease, although no gallbladder was present. This was also true in 35 of 60 other cases that have been reported.

1702 North Vermont Avenue.

REFERENCE

Dixon, C. F., and Licthman, A. L.: Congenital absence of gallbladder, Surgery, 17:11-21, Jan. 1945.

California
MEDICINE

OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8 PHONE DOUGLAS 2-0062

Editor, DWIGHT L. WILBUR, M.D.
Assistant to the Editor, ROBERT F. EDWARDS
Editorial Executive Committee
ALBERT J. SCHOLL, M.D., Los Angeles
H. J. TEMPLETON, M.D., Oakland
EDGAR WAYBURN, M.D., San Francisco

For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIALS

Chronic Diseases and Government

One of the problems besetting both the medical profession and the public health departments of the federal and state governments is the consideration of the care of patients suffering from non-contagious chronic diseases. The seriousness of the problem has been spotlighted in recent years through a series of spectacular events which have had wide publicity. The case of Lou Gehrig is a prime example of such events.

Physicians have long known the difficulties attendant on chronic disease cases. They have long recognized the need for care not available in the home and not generally available in hospitals or clinics except at a cost which may become prohibitive over a long period of time.

More recently federal and state health authorities have probed pretty deeply into chronic diseases. Federal funds have been made available to state health departments for studies on various diseases, and some state health departments have already initiated investigations along this line. The emphasis in these studies appears to be in locating or suggesting usable beds for the care of the chronic patient at reasonable cost.

California has been looking into the chronic disease situation for several years. A study by the State Department of Public Health last year produced some valuable statistics and made suggestions as to the relative realms of activity of health departments, private hospitals and private practitioners. Representatives of practicing physicians served on the various advisory committees in these studies and contributed to the findings.

More recently the American Medical Association established a committee on chronic diseases in its House of Delegates and honored California by appointing a California delegate as its chairman. This committee will tackle the national chronic disease situation.

Medicine has a large stake in any studies on chronic disease. It has the responsibility of maintaining the independence of the profession in treating patients who come under this category. It has the responsibility of establishing and maintaining a clear dividing line between the private practice of medicine and the operations of public health departments. And it has the responsibility of striving for the solution of chronic disease problems which constitute either a physical or a financial handicap to the public.

Here is a challenge which medicine must meet. Here is the opportunity to get in on the ground floor of one structural element in a changing social philosophy and provide it with proper guidance.

The A.M.A. in San Francisco

June 26 to 30 will see the American Medical Association meeting in San Francisco for the second time in four years. Already the city's hotels are groaning under the load of reservations and local and national committees are busy readying a myriad details for the expected influx. The A.M.A. meeting is big business.

In 1946 more than 7,700 Fellows of the A.M.A. registered in San Francisco. Wives, exhibitors, organization employees and others swelled the total registration to more than 12,000. This year it looks as though a similar figure will be reached, although the total would doubtless go higher if more hotel rooms were available.

San Francisco has become one of the few cities in the country which can handle an A.M.A. annual meeting. Its facilities in both meeting rooms and bedrooms place it in a class with New York, Chicago and Atlantic City in its ability to house such a large convention. Accordingly, San Francisco can look forward to an A.M.A. session every four or five years in the future. The city's bid for the 1953 meeting will be presented at this year's session and, if the bid is not accepted, the convention will probably be scheduled for San Francisco in 1954 or 1955.

As usual, the A.M.A. will bring with it the finest in modern medicine. The scientific sessions are without peer and the exhibits, both scientific and technical, are world-renowned. On top of that, colored television of surgical procedures will be brought to San Francisco for the first time. This feature, introduced last year at Atlantic City, is extremely popular. San Francisco surgeons and hospitals are cooperating to make this program outstanding, and it will be surprising if the long queues in Atlantic City are not duplicated outside the San Francisco television rooms.

For those who have not already made their reservations for the A.M.A. session, the time has come to do so.

* * *

CALIFORNIA MEDICAL ASSOCIATION

R. STANLEY KNEESHAW, M.D. .... President
DONALD CASS, M.D. .... President-Elect
LEWIS A. ALESEN, M.D. .... Speaker
DONALD A. CHARNOCK, M.D. .... Vice-Speaker
SIDNEY J. SHIPMAN, M.D. .... Council Chairman
L. HENRY GARLAND, M.D. .... Secretary-Treasurer
H. GORDON MacLEAN, M.D. .... Chairman, Executive Committee
DWIGHT L. WILBUR, M.D. .... Editor
JOHN HUNTON, Executive Secretary .... General Office, 450 Sutter Street, San Francisco 8
ED CLANCY, Field Secretary......Southern California Office, 417 South Hill Street, Los Angeles 13. Phone: MAdison 8863

NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 368th Meeting of the Council, San Francisco, March 19, 1950.

The meeting was called to order by Chairman Shipman in Room 214 of the Sir Francis Drake Hotel, San Francisco, on Sunday, March 19, 1950, at 9:15 a.m.

Roll Call:

Present were President Kneeshaw, President-elect Cass, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Henderson, Anderson, Ray, Montgomery, Lum, Pollock, Green, Shipman, Bailey, West, MacLean, Frees and Thompson, Secretary Garland and Editor Wilbur. A quorum present and acting.

Present by invitation were Executive Secretary Hunton, Assistant Executive Secretary Wheeler, Field Secretary Clancy, Legal Counsel Hassard, county society executive secretaries Kihm of San Francisco, Tobitt of Orange, Young of San Diego, Donovan of Santa Clara, Gillette of Fresno and Wood of San Mateo; Dr. D. H. Murray, legislative chairman; Dr. Wilton L. Halverson, state Director of Public Health; Dr. John R. Upton, Blood Bank Commission chairman; Dr. John W. Cline, A.M.A. Delegate; Dr. E. V. Askey, A.M.A. Delegate; Messrs. Clem Whitaker, Jr., and Ned Burman of public relations counsel. Present as guests during a portion of the meeting were Hon. Fred N. Howser, state Attorney General, and Hon. Ray Darby, chairman of the Los Angeles County Board of Supervisors.

1. *Minutes for Approval:*

(a) On motion duly made and seconded, following one amendment, minutes of the 367th meeting of the Council, held January 14, 1950, were approved.

(b) On motion duly made and seconded, minutes of the 219th meeting of the Executive Committee, held February 19, 1950, were approved.

2. *Membership:*

(a) A report of membership as of March 17, 1950, was received and ordered filed.

(b) On motion duly made and seconded, five members whose 1949 dues had been received since the last Council meeting were voted reinstatement as active members.

(c) On motion duly made and seconded in each instance, 13 applicants were elected to Associate Membership. These were:

Alameda County: William H. Clark, Joseph B. Cushman, Francis H. McMahon, Thomas R. Meagher, Edgar Rosen, James G. Telfer, James M. Tucker.

San Francisco County: H. N. Hultgren, Henry H. Jones, Louise E. Taber.

Ventura County: Harold E. Day, Benjamin Jacobs, Stella Stenley.

(d) On motion duly made and seconded in each instance, seven applicants were elected to Life Membership. These were:

Los Angeles County: J. Park Dougall, A. Ray Irvine, Scott D. Gleeten.

Sacramento County: William H. Pope, J. E. Yates.

San Luis Obispo County: F. R. Mugler.

San Mateo County: Harper Peddicord.

(e) On motion duly made and seconded in each instance, 28 applicants were elected to Retired Membership. These were:

Alameda County: W. L. Channel.

Fresno County: Everett Morris, James Elmo Pendergrass.

Los Angeles County: Clarence V. Clemmer, G. A. Fielding, Virgil L. Fisher, Joseph O. Hayhurst, Charles S. James, Russell A. Jewett, Edward J. Johnson, Mila J. Kinney, Rollan W. Kraft, Arthur Mark, Roy Robert Miller, Richard J. Morrison, Walter E. Nichols, Herbert L. Plannette, Harrison A. Putnam, Melvin J. Rowe, Leander Wm. Stark.

Sacramento County: Clarence H. McDonnell.

San Diego County: Horace G. Merrill.

San Francisco County: Leonard W. Buck, Philip Collischonn, R. W. Harbaugh, Chester B. Moore.

Tulare County: W. W. Tourtillott.

Ventura County: John W. Bardill.

(f) On motion duly made and seconded in each instance, 32 applicants were granted a reduction in dues because of illness or absence from practice for postgraduate study.

(g) On nomination of the San Diego County Medical Society, Dr. Alex Lesem was presented as a candidate for Council nomination to the House of Delegates for election to Honorary Membership. Action was deferred until Councilor West could investigate details and make a further report to the Council.

3. *Financial:*

(a) A report of bank balances as of March 17, 1950, was received and ordered filed.

(b) A report of receipts and expenditures for February and for the eight months ended February 28, 1950, previously mailed to the Council, was ordered filed.

(c) On motion duly made and seconded, legal counsel was instructed to prepare amendments to the Constitution and By-Laws to provide for the collection and enforcement by the Association of dues or assessments levied by the American Medical Association and similar amendments for consideration by the county societies.

(d) Chairman MacLean of the Auditing Committee presented an outline of a budget for the 1950-1951 fiscal year, in which the items for dues and for public relations expenditures were omitted. Dr. MacLean reported the opinion of the auditing committee that consideration be given to elimination of the current radio program and establishment within the Association of a public relations department. Following considerable discussion, it was regularly moved, seconded and voted that the Auditing Committee review this situation and make a further report to the Council.

On motion duly made and seconded, the report of the auditing committee on the outlined 1950-1951 budget was accepted.

4. *State Department of Public Health:*

Dr. Wilton L. Halverson, State Director of Public Health, discussed preparations being made by the State Disaster Council for an air detection service, training of monitors for atomic defense, and other emergency measures. He anticipates the establishment of a health division in the atomic defense setup.

Dr. Halverson reported that the bureau of Crippled Children's Services was conferring with Dr. Alesen's committee through its advisory committee. He also reported that the Cancer Commission of the Association and the American Cancer Society have plans under consideration to purchase ten copies of a cancer detection film to be shown to county medical societies and that his department is ready to bear the $2,000 cost of this purchase.

A contemplated morbidity survey was discussed by Dr. Halverson, who asked that a representative of the Association be named to serve on the advisory committee. It was regularly moved, seconded and voted that the Chairman make such appointment.

Dr. Halverson reported that the health problem posed by destitute migratory workers had lessened but was still present; several thousand are still living on available surplus food items. He suggested that this problem be considered as permanent.

5. *Benevolence Committee:*

It was reported that there had recently been a circularization of the county medical societies by the Los Angeles County Physicians' Aid Association for construction funds to finance a rest home planned in Los Angeles County. Dr. Crane reported that similar request had been made of all state medical associations, with a view toward ascertaining whether or not such associations would be interested in making this project national in scope. Several speakers pointed out the unlimited scope and potential expense of such a welfare program. Some suggested that the problem of aid to infirm or needy physicians was a *county* rather than a state problem. Dr. Anderson was requested to secure specific information as to the contemplated costs and general policy of the proposed rest home. On motion duly made and seconded, it was voted to allocate space to the Los Angeles County Physicians' Aid Association at the 1950 Annual Session.

6. *Blood Bank Commission:*

Dr. John R. Upton, chairman of the Blood Bank Commission, reported that the Red Cross had requested reciprocal arrangements with community blood banks, which the commission had approved on the basis of exchange of records of replacements and with a service charge of $6.00 per unit to be assessed by the creditor; replacements at the rate of two units for one received would cancel the service charge.

Dr. Upton asked that a loan fund of $150,000 be established to aid new county society-sponsored blood banks in getting started, loans from this fund to be made without interest and with the stipulation that matching funds be secured from other sources. He also reported that the community blood banks already in operation had voted to establish a statewide organization, the Association of California Blood Banks, for the exchange of statistics, standardization of techniques and equipment and other purposes.

It was regularly moved and seconded that a loan fund of $150,000 be established by the Association to provide loans to community blood banks, such loans to be made without interest and on the recommendation of the Blood Bank Commission with approval of the Auditing Committee. An amended motion to refer this matter to the Auditing Committee for further study was lost. After considerable discussion, it was regularly moved, seconded and voted to table the original motion. Dr. Upton was requested to present this matter before the House of Delegates on April 30.

7. *Executive Session:*

At this point the Council voted to go into executive session. In this period, among other things, Dr. John W. Cline requested authority and financing to provide entertainment for two days prior to the A.M.A. Annual Session to the Officers and Trustees of the A.M.A. It was regularly moved, seconded and voted to authorize this proposal.

Following discussion of several items, the Council voted to rise from executive session.

8. *Public Policy and Legislation:*

Dr. D. H. Murray, chairman of the committee on Public Policy and Legislation, discussed the coming elections and called attention to the need of all voters supporting candidates whose records and views were in accord with sound democratic principles.

9. *Legal Department:*

Mr. Howard Hassard, legal counsel, discussed several recent court decisions pertaining to expert testimony. A joint opinion of Mr. Hassard and Mr. A. J. Kennedy, attorney for state dental associations, regarding hypnotic drugs, was presented and discussed. Mr. Hassard also reported on the meeting of the American Academy of Forensic Sciences, which was attended by Dr. Louis Regan as a C.M.A. representative. More than one hundred attended this meeting, at which a permanent organization was established and Dr. Regan elected a member of the Executive Committee. It was regularly moved, seconded and voted to request Dr. Regan to continue as a C.M.A. representative in this body.

10. *Committee on Public Health and Public Agencies:*

Dr. Alesen, chairman, recommended that the Council appoint one of its members to work with the advisory committee to the Crippled Children's Bureau of the State Department of Public Health and it was regularly moved, seconded and voted that such appointment be made. The Chairman, with the consent of the Council, appointed Dr. Hartzell Ray in this capacity.

Dr. C. V. Thompson reported on a meeting held January 27 with hospital representatives, at which time discussion was held on by-laws and other articles to govern staff organizations of district hospitals. Further meetings along this line are planned.

11. *Nursing:*

(a) Consideration was given to adoption of a statement on nursing, in which the Association's attitude might be outlined. After discussion it was regularly moved, seconded and voted that no action be taken at this time.

(b) A request for the appropriation of $2,500 toward a fund to provide an organized campaign of student nurse recruitment was received and after discussion it was regularly moved, seconded and voted to make such appropriation, with the understanding that the balance of a budgeted $10,000 program were realized from other sources.

12. *Industrial Medical Fees:*

Mr. Hassard discussed possible procedures in connection with a number of claims filed with the Industrial Accident Commission for adjustment of medical fees claimed during a period when the Commission did not recognize any fee schedule. After discussion it was regularly moved, seconded and voted that letters be sent to all such claimant physicians, the Commission being willing, stating that the settlement of such claims should be considered an individual matter.

13. *American Medical Association:*

(a) A suggestion by the A.M.A. that statewide grievance committees be established was discussed and it was pointed out that many county societies already maintain such committees but that in some of the smaller societies such committees, while called upon infrequently, are not effective. On motion duly made and seconded, it was voted to establish a statewide committee, to function when called upon by the county societies.

(b) At his request, Dr. Lewis A. Alesen was succeeded as chairman of the Committee on Emergency Medical Services by Dr. Justin J. Stein of Los Angeles. It was agreed that Dr. Stein's expenses be met for a May meeting in Chicago of the Council on Emergency Medical Service of the A.M.A.

(c) On motion duly made and seconded, Dr. Allen Hinman of San Francisco was appointed California representative at the 1950 A.M.A. "Grass Roots Conference" of county society officers.

14. *Tribute to Dr. George Dock:*

On motion duly made and seconded, the following resolution was unanimously adopted:

Whereas, George Dock has distinguished himself as teacher, clinician and scholar; and

Whereas, He has brought great prestige, erudition and clear thinking to the profession of medicine; and

Whereas, He has for three decades given freely of his learning and scholarship to the profession in California; now, therefore, be it

RESOLVED, That the Council of the California Medical Association presents greetings and hearty best wishes to Dr. George Dock on the happy occasion of his ninetieth birthday.

Done in the City of San Francisco at the 368th Meeting of the Council of the California Medical Association, this 19th day of March, A.D. 1950.

15. *Cancer Commission:*

Dr. Kneeshaw read a report presented by Dr. Lyell C. Kinney, chairman of the Cancer Commission, on conferences held in the past year and contemplated for next year. This report was ordered accepted, with thanks to Dr. Kinney, and referred to the Editor for consideration for publication.

16. *Committee on Voluntary Health Insurance:*

Dr. Donald A. Lum, chairman of the special Committee on Voluntary Health Insurance, reported that his committee (Ray and Ball, members) had determined that it was not practicable at this time to enter into either of two proposals which have been under consideration by the committee. On motion duly made and seconded, it was voted to approve this report.

17. *Committee on Medical Students, Interns and Residents:*

On motion duly made and seconded, it was voted to authorize the Committee on Medical Students, Interns and Residents to offer copies of a pamphlet to those requesting it. It was also suggested that this committee confer with public relations counsel in planning further editions of its publication, *Future.*

18. *Time and Place of Next Meeting:*

It was agreed to hold the next meeting of the Council at Hotel del Coronado, San Diego, at 9:00 a.m., Saturday, April 29, 1950.

Adjournment:

There being no further business to come before the meeting, it was adjourned at 7:00 p.m.

S. J. Shipman, M.D., *Chairman*
L. H. Garland, M.D., *Secretary*

Executive Committee Minutes

Tentative Draft: Minutes of the 220th Meeting of the Executive Committee, San Francisco, March 19, 1950.

The meeting was called to order by Chairman MacLean in Room 214 of the Sir Francis Drake Hotel, San Francisco, on March 19, 1950, at 7:00 p.m.

Roll Call:

Present were President Kneeshaw, President-Elect Cass, Speaker Alesen, Council Chairman Shipman and Auditing Committee Chairman MacLean. A quorum present and acting.

1. *Rotation of Auditors:*

On motion duly made and seconded, it was voted to employ a new auditor to audit the books of the Association, such auditor to be selected and instructed by the Auditing Committee. It was the feeling of the committee that quinquennial or decennial rotation of auditors should be a recommended policy of the Association.

2. *Reception for President:*

On motion duly made and seconded, it was voted to hold as a part of the Annual Session a reception to the President, to be attended by the President's personal guests, members of the Council, guest speakers and chairmen of those sections with invited guests.

Adjournment:

There being no further business to come before the meeting, it was adjourned at 7:10 p.m.

H. G. MacLean, M.D., *Chairman*
L. H. Garland, M.D., *Secretary*

In Memoriam

Baker, Clark Dyer. Died in Los Angeles, February 23, 1950, aged 73. Graduate of Rush Medical College, 1903. Licensed in California in 1908. Dr. Baker was a member of the Los Angeles County Medical Association, and a retired member of the California Medical Association.

◆

Boone, William Roscoe. Died in Berkeley, March 21, 1950, aged 65, of coronary occlusion. Graduate of the Oakland College of Medicine and Surgery, 1912. Licensed in California in 1912. Dr. Boone was a member of the Alameda County Medical Association, the California Medical Association, and the American Medical Association.

◆

Chamberlin, Harrie H. Died in Los Angeles, March 10, 1950, aged 67, of a heart attack. Graduate of the University of Southern California School of Medicine, Los Angeles, 1906. Licensed in California in 1906. Dr. Chamberlin was a member of the Los Angeles County Medical Association, and a life member of the California Medical Association.

◆

Darrow, Arthur Charles. Died in San Fernando, February 17, 1950, aged 39, of virus pneumonia complicated by acute pulmonary edema. Graduate of the Washington University School of Medicine, St. Louis, 1936. Licensed in California in 1945. Dr. Darrow was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

DePuy, Clarence Augustus. Died in Oakland, March 12, 1950, aged 67, of acute coronary occlusion. Graduate of the College of Physicians and Surgeons of San Francisco, 1905. Licensed in California in 1906. Dr. DePuy was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Dunn, Richard Henry. Died in San Francisco, March 4, 1950, aged 68, of a heart attack. Graduate of the College of Physicians and Surgeons of San Francisco, 1906. Licensed in California in 1907. Dr. Dunn was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Garstang, Donald Buie. Died in Los Angeles, March 5, 1950, aged 71. Graduate of the Washington University School of Medicine, St. Louis, 1904. Licensed in California in 1919. Dr. Garstang was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Huntington, Herbert Arthur. Died in West Los Angeles, March 18, 1950, aged 57, of a heart attack. Graduate of Stanford University School of Medicine, Stanford University-San Francisco, 1926. Licensed in California in 1926. Dr. Huntington was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Marsh, Otto George. Died in San Diego, March 13, 1950, aged 63. Graduate of Jefferson Medical College of Philadelphia, 1909. Licensed in California in 1909. Dr. Marsh was a member of the San Diego County Medical Society, the California Medical Association, and the American Medical Association.

◆

Moore, Jack Beals. Died in San Francisco, February 19, 1950, aged 53, of a heart ailment. Graduate of Stanford University School of Medicine, Stanford University-San Francisco, 1928. Licensed in California in 1928. Dr. Moore was a member of the Fresno County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Richter, Conrad. Died in Newport Beach, March 8, 1950, aged 89. Graduate of the Rush Medical College, 1887. Licensed in California in 1898. Dr. Richter was a member of the Orange County Medical Society, and a retired member of the California Medical Association.

◆

Solomon, William Otto. Died in San Francisco, March 10, 1950, aged 62, of a brain tumor. Graduate of the University of California Medical School, Berkeley-San Francisco, 1918. Licensed in California in 1918. Dr. Solomon was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Stoops, Roy Philson. Died in Colima, Mexico, February 25, 1950, aged 73, of diabetes and heart failure. Graduate of the University of Illinois College of Medicine, Chicago, 1903. Licensed in California in 1923. Dr. Stoops was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Weber, Arthur Leo. Died in Upland, March 8, 1950, aged 66, of a heart attack. Graduate of Northwestern University Medical School, Chicago, 1910. Licensed in California in 1910. Dr. Weber was a member of the San Bernardino County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Whiffen, Roscoe Albert. Died in San Jose, March 14, 1950, aged 77. Graduate of the University of Illinois College of Medicine, Chicago, 1897. Licensed in California in 1901. Dr. Whiffen was a member of the Santa Clara County Medical Society, and a retired member of the California Medical Association.

◆

Zochert, Lebrecht W. Died in San Diego, February 13, 1950, aged 75. Graduate of Milwaukee Medical College, 1897. Licensed in California in 1912. Dr. Zochert was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

• Questions and Answers about C. P. S. •

If you have any questions regarding C.P.S., submit them to the Editor.

★ ★ ★

Question: If I, as a physician-member, have been advised that a C.P.S. patient has received maximum benefits for medical treatment of a certain condition, does the patient have any further coverage for the same ailment?

Answer: Neither a definite "yes" or "no" answer can be given to this question unless certain other pertinent information is also known.

To explain: C.P.S. beneficiaries are entitled to one year of medical and surgical coverage for each ailment; and up to one year's hospitalization if continuously registered as a bed patient—21 days at full cost and 345 days at half cost. (Two exceptions: Ninety days' coverage for chronic ailments; two years' coverage or $5,000 in services for 23 listed "catastrophic" ailments.) When a C.P.S. patient has exhausted his benefits for medical treatment for a certain condition, he may or may not have exhausted his surgical and hospital benefits for the same ailment. If surgical and hospital benefits have also been entirely used, then no further coverage is allowable. However, if all or part of the surgical and/or hospital benefits have not been used, the patient is entitled to those benefits until they also have been exhausted.

In regard to this question, it is pertinent to point out that surgical coverage means: One year's care for surgery, including postoperative care and any and all related complications or recurrences.

Question: If C.P.S. allows free choice of physicians to its members, why is a special roster of physician-members needed?

Answer: C.P.S. does allow free choice of physicians. The roster of physician-members simply lists those physicians who are enrolled as doctor-members of C.P.S. In seeking service, C.P.S. beneficiary members are not restricted to the physicians listed in the roster; they may select any licensed physician. In fact, they may go to a licensed physician anywhere in the world if they happen to be outside the state of California when in need of treatment.

But persons whose income is under the $3,600 ceiling know that C.P.S. physician-members will accept C.P.S. fees as payment in full. Veterans know they can receive out-patient treatment from C.P.S. doctors.

Naturally, the fact that a list of physician-members is maintained often works to the advantage of C.P.S. patients and C.P.S. physicians. This is as it should be, because the health plan is designed to be of mutual benefit to the people who belong and to the doctors who support it.

Question: How does an individual physician-member have any voice in the operation of C.P.S.?

Answer: Each C.P.S. physician-member is represented by the delegates to the California Medical Association, as well as by the members of his county advisory committee to C.P.S. In addition, physician-members at all times may contact the C.P.S. administration directly by letter or in person.

Question: May doctors visit C.P.S. offices to view the internal operations of their health plan?

Answer: Yes. All physician-members have a standing and cordial invitation to visit C.P.S. offices, and C.P.S. urges doctors to utilize this opportunity of becoming better acquainted with the many operational phases of the health plan. In the course of such visits, C.P.S. personnel will gladly explain the functions of each department.

Question: How can C.P.S. patients be urged to notify their doctor of their C.P.S. membership at the time of the first visit?

Answer: C.P.S. has prepared attractive plastic stand-up plaques for the receptionist's desk in a doctor's office. The plaques, which request C.P.S. patients to present their identification cards on the first visit, are obtainable from the Physicians Relations Department.

Question: If C.P.S. rejects a doctor's claim because the services are not covered under the patient's contract, from whom may the doctor expect payment?

Answer: From the patient. The patient is responsible for the cost of all services not covered by his contract.

Question: How can a doctor determine whether a C.P.S. patient is over or under the $3,600 income ceiling?

Answer: First, the patient should be asked to complete the top portion of Billing Form No. 9, wherein the patient signs a statement which indicates his income status. If the doctor has reason to doubt the patient's statement on Billing Form No. 9, the doctor is privileged to request more information —such as the name of the patient's employer, the position he holds, etc. If the physician is still doubtful, he then may request the patient to furnish a notarized income affidavit. These income affidavits are available from C.P.S.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

An award of $100 for the best paper on any subject in the general field of cardiovascular disease, and an opportunity to present the treatise before the Los Angeles Heart Association Fall Symposium in October, is being offered to interns and residents and to physicians who have finished internship or residency in any approved Southern California hospital in the last twelve months. Papers from those who have completed internship or residency must be based on work done during the hospital training period. Deadline for entering papers in the contest is August 1, 1950. Manuscripts or **communications regarding the contest** may be addressed to William D. Evans, M.D., Secretary, Los Angeles Heart Association, 1670 Beverly Boulevard, Los Angeles 26.

* * *

Dr. Marshall R. Urist, consultant in orthopedic surgery to the Student Health Service of the University of California at Los Angeles, received the first Kappa Delta Award and a prize of $1,000 for the most important original research in orthopedic surgery by an individual in 1949.

Nomination of Dr. Urist for the award was made by the committee on scientific investigation of the **American Academy of Orthopedic Surgeons.** The work for which the award was given was reported in an article "Endosteal-Bone Formation in Estrogen-Treated Mice," which was published in the January 1950 issue of the *Journal of Bone and Joint Surgery.*

SAN FRANCISCO

The Sixth Annual Conference of the **American Society for the Study of Sterility** will be held at the Sir Francis Drake Hotel, San Francisco, June 24 and 25, 1950. Program chairman is Dr. John O. Haman, San Francisco.

* * *

A prize essay contest, with an award of $150 for the winner and $100 to the runner-up, has been announced by the San Francisco Surgical Society. The contest is open to general surgeons in San Francisco and vicinity who are in the period of graduate training and who were graduated from medical school not more than six years ago.

Papers entered in the contest must be in the hands of the secretary of the society not later than July 1, 1950. Rules of the contest and other particulars may be obtained from Dr. Leon Goldman, secretary of the society, University of California Hospital, San Francisco 22.

* * *

The annual meeting and the 23rd scientific sessions of the **American Heart Association** will be held in San Francisco June 22-25, in the week immediately preceding the annual meeting of the American Medical Association.

GENERAL

Renewal of three grants totaling $75,820 and award of a fourth for $10,000 to California institutions to aid in **cancer control projects** was announced recently by the National Cancer Institute of the U. S. Public Health Service. The new grant of $10,000 went to Los Angeles County Hospital to provide for a tumor slide library and registry under the direction of Dr. Edward M. Butt. The three renewals were as follows: $24,000 to the University of California at Los Angeles School of Medicine for evaluation of cancer diagnostic tests, $8,500 to the California State Department of Public Health for studies on occupational cancer of the respiratory tract, and $43,320 to the University of California, San Francisco, for diagnosis of cancer by cytologic examination of body secretion under the direction of Dr. Herbert F. Traut.

* * *

The Annual California Medical Association **Conference of County Medical Society Secretaries** was held in San Francisco, Saturday, March 18. The following county medical societies were represented by their secretaries: Alameda, Fresno, Humboldt, Imperial, Kern, Los Angeles, Marin, Mendocino-Lake, Merced, Monterey, Orange, Sacramento, San Bernardino, San Francisco, San Joaquin, Santa Barbara, Santa Clara, Santa Cruz, Siskiyou, Sonoma, Tulare, and Ventura. San Diego, San Mateo, Fresno, Kern, Orange, San Francisco, and Santa Clara counties were represented by their executive secretaries.

These county medical societies were not represented: Butte-Glenn, Contra Costa, Inyo-Mono, Kings, Lassen-Plumas-Modoc, Napa, Placer-Nevada-Sierra, Riverside, San Benito, San Luis Obispo, Shasta, Solano, Stanislaus, Tehama, Yolo, and Yuba-Sutter-Colusa.

In addition to the county society officers, members of the Council of the California Medical Association, the Editor, legal counsel, and several officers of the Association were present.

After an address of welcome by President Kneeshaw, Dr. Lester Lawrence of Alameda County gave an excellent talk on "The Present Status of the Alameda County Medical Association Public Relations Program." This was followed by considerable discussion. Mr. William Bowman, executive director of C.P.S., then gave a financial report on the current sound status of C.P.S. and discussed "What California Physicians' Service Would Like the County Society Officers to Do."

Dr. C. A. Broaddus outlined in considerable detail the plans for the 1950 C.M.A. Postgraduate Activities program. Further announcements of this will appear in the journal. Dr. Ben Frees gave a stimulating account of the present phase of the A.M.A. public education campaign.

After luncheon, Mr. Howard Hassard gave a talk on medicolegal developments, notably in connection with new hospital construction. Dr. S. J. Shipman discussed the organization and operations of the Council. Dr. Dwight Murray brought the group up to date on state and federal legislative matters.

The Secretary of the Association presided at the meeting and briefly outlined the scientific program and arrangements for scientific exhibits, medical motion pictures and other attractions at the annual meeting.

There was an excellent discussion of most of the topics by several of the secretaries and by some of the councilors. The meeting adjourned at 4 p.m.

Simultaneously with publication last month of the **first issue of GP,** a new and outstanding attractive journal published by the American Academy of General Practice, the appointment of Dr. Walter Alvarez as medical editor was announced. Dr. Alvarez, who is retiring as senior consultant in the Division of Medicine in the Mayo Clinic, succeeds the late Dr. F. Kenneth Albrecht under whose editorship the first issue of *GP* was produced. Dr. Albrecht died in March following an automobile accident. The new editor was selected from among several outstanding candidates by the Academy's Publication Committee which is headed by Dr. Stanley R. Truman of Oakland.

* * *

"Compulsory health insurance is far from popular among city dwellers, according to a survey just completed by the Psychological Corporation, New York, in 25 cities and towns from coast to coast," Dr. George F. Lull, Secretary and General Manager of the American Medical Association, reports in a letter to secretaries of state medical associations.

The question asked in the survey, Dr. Lull said, was: "Which do you favor: (a) to have government give free doctor and medical services which would be paid for by a 3 per cent payroll tax on all wages under $3,600, or, (b) the present system of medical service?" In the answers, 65 per cent favored the present medical service, 26 per cent favored government medicine, and 9 per cent were uncertain.

"Even in the lower income group, the lowest third which is supposed to benefit most from government medicine, 51 per cent were against the plan while 37 per cent favored it," the letter continued.

"In an April 1947 survey on what people consider good and bad Americanism, the following question was asked:

" 'Which is better for America: (a) to have the government give free doctor and medical service which would be paid for by a tax like the Social Security tax; or (b) the present system of medical service?' In the answers, 63 per cent favored the present medical service, 30 per cent favored government medicine, and 7 per cent uncertain.

"Insofar as the two questions and surveys are comparable," Dr. Lull's letter concluded, "it would seem that, in spite of the heavy government propaganda in favor of socialized medicine, there has been little change in the proportion of people who favor government medicine."

* * *

The American Congress of Physical Medicine will hold its 28th annual scientific and clinical session August 28 to 31 and September 1, 1950, inclusive, at the Hotel Statler, Boston. Scientific and clinical sessions will be given on the days of August 28, 29, 30, 31 and September 1, 1950. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction seminars will be held August 28, 29, 30 and 31. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

* * *

Grants in aid of **heart disease research** totaling $25,830 have been divided among five projects in three California institutions by the American Heart Association. Two of the grants were awarded to the Harold Brunn Institute for Cardiovascular Research, San Francisco: One a continuation grant of $3,360 for studies on coronary thrombosis being carried on by Dr. John J. Sampson, and the other in the amount of $6,300 for study of arteriosclerosis by Dr. Meyer Friedman. Two were awarded to support projects at the University of Southern California School of Medicine: $8,820 for study of hypertension by Drs. Douglas R. Drury and Leo A. Saperstein, and $3,150 for research on the chemistry of constriction of the blood vessels by Drs. Chester Hyman and Walter Marx. The Institute of Medical Research, Cedars of Lebanon Hospital, Los Angeles, was awarded $4.200 for study of hypertension by Dr. Jessie Marmorston.

BOOK REVIEWS

PROGRESS IN NEUROLOGY AND PSYCHIATRY—An Annual Review—Volume IV. By E. A. Spiegel, M.D., Professor and Head of the Department of Experimental Neurology, Temple University School of Medicine, Grune & Stratton, New York, 1949. $10.00.

This annual review of progress in the fields of neurology and psychiatry maintains its high standards of coverage established in previous volumes. As is inherent in any work representing the efforts of a considerable number of reviewers, there is a certain amount of variation in the completeness of coverage and style of presentation, but all of the chapters are adequate, although some are better than others.

The volume is obviously directed at the specialist in these fields, and is of very considerable value as a reference work covering the period. Although intelligible to the general physician, it is doubtful if his interest would carry him through many of the more technical parts.

The great volume of publications in even as restricted a portion of the field of medicine as this makes reviews of this nature almost a necessity if the specialist is to be able to keep abreast of new developments. This book well serves the needs of the neuropsychiatrist in this regard.

* * *

INTESTINAL INTUBATION. By Meyer O. Cantor, M.D., Assistant Attending Surgeon, Grace Hospital, Detroit, Michigan. Charles C. Thomas, Publisher, Springfield, Ill. 1949. $7.50.

This book of 333 pages and 138 illustrations covers chapters on the history of the development of indwelling intestinal suctional tubes, anatomy of the gastrointestinal tract, as well as physiology. There is an excellent chapter on distention of the gastrointestinal tract. Other chapters are on technique of intubation, types of tubes used, and disorders of the bowel requiring intubation, as well as chapters on complications and errors in its use and also responsibility of the person in charge of intubation of patients.

The last two chapters deal with a series of experimental studies dealing with the effect of intestinal gases and hydrogen sulfide on balloons. It is not very likely that the practical surgeon would be interested in the last two chapters and he will find that some of the material in other chapters might prove of little practical value.

The author is convinced of the superior value of the Cantor tube in all respects. The book, however, covers every phase of intubation so well that it should be in every hospital library and many surgeons will consider it of great value in solving some of the problems and complications of the indwelling intestinal suction tube.

* * *

HEALTH INSTRUCTION YEARBOOK, 1949. Compiled by Oliver E. Byrd, Ed.D., M.D., F.A.P.H.A., Professor of Health Education and Director, Department of Hygiene, School of Education, Stanford University. Stanford University Press, Stanford, California. 1949. $3.50.

In preparing this seventh yearbook, Dr. Byrd read 1,643 articles from which he presents a digest of 255 which had appeared in 80 different periodicals or reports. The abstracts are arranged under 21 headings such as Nutrition and Health, Infection and Immunity, Care of Special Organs, Health as a Social Problem, Occupational Health. Each topic or chapter begins with a summary statement highlighting major developments in that area, followed by the abstracts. Then follow the bibliography giving the full title and source of the abstracts, an alphabetical list of the sources, an author index and a subject index. The subjects are well chosen, interestingly presented and give a broad panorama of achievements in the health field. The book can be recommended to all American health workers, whether they are teaching individual private patients or groups as at meetings or in classrooms.

* * *

SURGICAL AND MAXILLOFACIAL PROSTHESIS. By Oscar E. Beder, King's Crown Press, Columbia University, 1949. $3.00.

The field partly covered in this book is of interest to the surgeon whose patient is to have use for oral prosthesis, and to the general dental practitioner. It is, however, seldom put to good use by either. This is due in the main to two reasons: First, the relatively few patients of this nature encountered in practice and second, the lack of realization by the medical profession that such aid may be offered by dentistry. The author suggests a closer tie between the two professions in this particular field. Great strides were made during the last war but these were usually confined to specialties; i.e., plastic surgery and its respective maxillofacial teams.

The book is composed of nine chapters dealing with most of the prosthetic appliances of the field; i.e., intraoral splints, stents, and obturators, extraoral cranial plates, noses, and ears.

Of interest to medical men may be the chapter dealing with protective shields for radiation therapy. The chapter in obturators is informative to the general dentist, for most laboratory procedures are quite well covered throughout.

There is very little new material included, even though much was accomplished in this field during World War II. Splints described are all of the cap type. Such improvements as the sectional screwlock type are not mentioned.

The book would serve well as a manual for advanced student classes or to the general practitioner who is called upon to make one of these appliances without much previous experience. To the advanced prosthetist, it helps as a teaching guide.

* * *

ATLAS OF SURGICAL OPERATIONS. Second Edition. By Elliott C. Cutler, M.D., Late Moseley Professor of Surgery, Harvard University, and Chief Surgeon, Peter Bent Brigham Hospital; and Robert M. Zollinger, M.D., Professor and Chairman of the Department of Surgery, Ohio State University College of Medicine. Illustrated by Mildred B. Codding, A.B., M.A. The Macmillan Company, N.Y. 1949. $9.00.

The second edition of this standard atlas has been enlarged and improved in a number of ways. Almost half of the plates have been redrawn. Many procedures have been added, among these being a small section on injuries to the central nervous system, and vagotomy through the abdominal approach.

The printing of the copy reviewed was clearer than that of the first edition with which it was compared.

The book covers all of the common procedures used in general surgery. No bibliographies are included and the descriptive text is simple and direct. It is recommended to the busy general surgeon, but mostly to the young surgeon who is learning operative technique. The medical student will find it an excellent reference volume.

UROLOGIC ROENTGENOLOGY. By Miley B. Wesson, M.D., Past President, American Urological Association. Third Edition, Thoroughly Revised, with 284 Illustrations. Lea & Febiger, Philadelphia, 1950. $7.50.

The third edition of Wesson's book has been thoroughly revised and rewritten. For many years Dr. Wesson has edited and reviewed most of the urologic papers presented before the meetings of the Western Section of the American Urological Association. His long experience in editorial work has given him an understanding of the needs and reading habits of doctors. He has a manner and style of writing all his own, concise, easy to read, and complete. In his book the newer procedures of urography, including technique, pitfalls and complications, are thoroughly discussed and there are instructive chapters on the history and technique of urography. Many new illustrations have been added, the book in general depicting almost all urologic conditions. The urograms, mostly from the author's cases, some winnowed from the urologic clinics throughout the country, are reproduced clearly on excellent paper. Each picture is accompanied by a brief history, many containing data concerning surgical or necropsy findings.

The book is compact and easy to handle, and there is a satisfactory, up-to-date bibliography at the end of each section. It is a satisfactory consultation source for students, general practitioners who want aid in interpreting films of their patients, and for the urologist who needs help in reviewing an unusual case.

* * *

DOCTOR AND PATIENT AND THE LAW. By Louis J. Regan, M.D., LL.B., Member State Bar of California; Professor of Legal Medicine, College of Medical Evangelists. Second Edition. The C. V. Mosby Company, St. Louis, 1949. $10.00.

The second edition of this book, which has just appeared, has been augmented by the addition of new sections which are most important for a complete treatise on the subject of the connection of law and medicine. Also new material and court decisions have been added.

While this book will necessarily be a valuable reference guide, it is also one that is readable and of the utmost interest. It is the kind of volume that the doctor will want to take home with him and read from cover to cover before returning it to his office library for reference. The many cases described are each a short story and one cannot but feel compassion for the physicians who have gone through the mental anguish and loss of valuable time and money in their experiences in the courts. The author has been most careful in not making the volume too technical, and no lawyer who was not also a doctor could have so deftly presented the subject in the manner in which the matter is described for a medical reader.

Physicians are apt to consider the subject of malpractice to be only one in which they should have legal concern. Such things as artificial insemination, dying declarations, consent for operation, sterilization, adoption, matters pertaining to the insane, are only a few examples of legal points with which the physician should be conversant. All of these subjects are understandingly outlined.

There is no doubt that this book is good prophylaxis, and if one could keep in mind constantly the advice and warning contained therein many of the minor as well as the major difficulties the doctor gets into aside from his clinical work could be avoided. As a code for proper professional conduct there has nothing yet been presented that so precisely fills the need. Undoubtedly this volume will become a classic. While it is needful that the clinician arm himself with technical treatises, the practicing physician, after all, is a public character and his activities extend beyond technical procedures. It is just as essential that he be aware of his legal obligations and how to protect himself as it is for him to know how to treat the patient. This book is as needful to a well rounded office library, no matter how small, as is a good book on anatomy.

* * *

MODERN SURGICAL TECHNIQUE — Second Edition. Edited by Max Thorek, M.D., LL.D., Sc.D., F.I.C.S., D.C.M. Professor of Surgery, Cook County Graduate School of Medicine. Four Volumes and an Index Volume. Volume One: General Operative Considerations; Surgery of the Head and Neck; and Principles of Plastic Surgery. Volume Two: Neurosurgery; Vascular Surgery; Thoracic Surgery; and Orthopedic Surgery. Volume Three: Surgery of the Abdomen and Surgery of the Breast. Volume Four: Gynecologic Surgery; Urologic Surgery and Hernia Repair. J. B. Lippincott Company, Philadelphia, 1949. $72.00.

The second edition of this successful set of books on surgical technique has followed 11 printings of the first issue, published in 1938, affording ample testimony of its popularity. It is now fully embellished with medical illustrations by Shepard, Freret and Bartenbach, as well as some of the color plates of Peham and Amreich. The type is now set in two columns on one page, a form adopted by other modern textbooks. It has been necessary to add another volume, making four in all, to include over one thousand new pages.

In a chapter entitled "Selection and Management of Poor Risk Patients," various conditions such as diabetes, nephritis, obesity and surgery in infancy and old age are discussed. In subsequent sections, greater consideration is given to postoperative care. The section on blood transfusion is excellent.

A good many procedures not usually included in the scope of general surgery are described and illustrated. The author states he has done this so that the surgeon can be acquainted with the current procedures in all branches of surgical knowledge, for in an emergency he may be called upon to perform an operation not generally included in his domain.

The section on the surgery of the thorax, which formerly required 159 pages, now requires 200, mostly because of the new cardiovascular operations. In the section on orthopedic surgery, it is regrettable that the Bunnell-Howard pull-out wire method of tendon suture was not described. There is an excellent review of the various methods used in local and regional anesthesia, but the dangers of local anesthesia and tourniquets in the surgery of the infected finger are not stressed. Practically all the common operative procedures on the gastrointestinal tract are clearly illustrated. It might be questioned whether it is necessary or advisable to include such mechanical devices as the Murphy button in a system of modern surgical technique.

The set is recommended as a handy reference for student, general surgeon, and surgical libraries.

* * *

BRITISH SURGICAL PRACTICE. Volumes III, IV and V. Under the General Editorship of Sir Ernest Rock Carling, F.R.C.S., F.R.C.P., Consulting Surgeon, Westminster Hospital, and J. Patterson Ross, M.S., F.R.C.S., Surgeon and Director of Surgical Clinical Unit, St. Bartholomew's Hospital; Professor of Surgery, University of London. In Eight Volumes. Butterworth & Co. (Publishers), Ltd., London, England—The C. V. Mosby Company, St. Louis, Mo., 1948. $15.00 per volume.

These three books represent three more volumes of the contemplated eight volumes of the series on British Surgical Practice. Volume III deals with subjects from cesarean section to eyelids and covers such diverse subjects as carotid body, cellulitis, cervical rib, cicatrices, cisternal puncture, colonic diseases, compensations, constipation, cornea, patent ductus, ear surgery, endoscopy, and eye surgery. Volume IV covers surgery from facial palsy to hiccups, discussing facial injuries, fascial disorders, fistula, focal epilepsy, foot surgery, gallbladder surgery, gastric surgery, glaucoma, glomus tumors, glottic edema, gout, hand, heart, hernia, herpes, and hiccup. Volume V extends from Hodgkin's disease to lymphogranuloma, discussing hormones, hypertension, impotence, injury, jaundice, joint disorders, kidney diseases, larynx, legal surgery, ligatures, limbs, leprosy, cirrhosis, lung tumors, and lupus vulgaris. The reviewer regrets that he cannot recommend any of these three volumes. Each volume costs $15, is about 500 pages, but represents such a conglomeration of disorganized material that it is of no value unless all eight volumes are simultaneously available. The tone of the books must be leveled for the general practitioner, but the information is not organized in a serviceable manner. Much of it is outdated by the time all eight volumes will have been completed, and even now sections of it are antiquated. The book would not be of value to surgeons, for it covers all specialties inadequately, is generally wanting in technical knowledge, and wastes much space in discussing most problems at student levels. Without prejudice the reviewer can honestly say the recent American books far excel this series in every respect.

* * *

HELPFUL HINTS TO THE DIABETIC. By William S. Collens, B.S., M.D., Chief of the Diabetic Clinic, Chief of the Clinic for Peripheral Vascular Diseases, Associate Attending Physician, Maimonides Hospital, New York, and Louis C. Boas, A.B., M.D., Chief of the Diabetic Clinic, Associate Visiting Physician, Greenpoint Hospital, New York. Charles C. Thomas, Publisher, Springfield, 1949. $3.00.

A description of this volume by Collens and Boas is well delineated by the authors in their preface:

"The purpose of this book is to assist the diabetic in the management of his condition. We have tried to supply the reader with all the practical information he needs to understand the disease from which he is suffering. This should give him the equipment necessary to cooperate intelligently with his physician.

"We have tried, in as simple terms as possible, to tell the patient what diabetes is, to provide him with practical hints and suggestions in the preparation of his diet, to teach him the proper technique in the administration of insulin, to teach him many simple laboratory procedures that he needs to know and to tell him something about the complications of this disease.

"We have tried, also, to guide the reader through the forest of misinformation to which he is continuously exposed by quacks, pseudo-scientific newspaper articles and well-meaning neighbors."

The reviewer feels that the aims expressed above have been accomplished very well indeed. The text is well written, comprehensive and clinically sound. The illustrations are numerous and excellently reproduced. Particular emphasis may be given to the 26 excellent illustrations (drawings and photographs) of the step-by-step technique of insulin administration.

Unique in the reviewer's experience with such manuals is the section devoted to a detailed expose of some of the more notorious quack remedies and treatment that have led so many patients astray to their harm or complete undoing.

* * *

LIMBO TOWER. By William Lindsay Gresham. Rinehart & Company, Inc., New York. $3.00. 1949.

This is a novel covering the events of three days in a state hospital and particularly concerning the patients, doctors, nurses and attendants on the ninth floor tuberculosis ward. The usual conglomeration of "types" are found here, the malingerer, a Negro boxer, a gambler, an evangelist, and a young, sensitive Marxist. For love interest, there is, of course, the beautiful nurse and the handsome intern. God, religion, psychoanalysis, philosophy, politics, economics, and Marxism are all expounded through the mouths of these characters. But high-sounding phrases do not make this any kind of penetrating psychological study of the interpersonal relationships of a group of people on a hospital ward for a chronic disease like tuberculosis. The characters and incidents are too stereotyped to be considered real. This novel can hardly compete with the depth and wisdom contained in Thomas Mann's "Magic Mountain," but nevertheless one can spend an enjoyable few hours reading it if one appreciates "light reading."

* * *

CLINICAL DIAGNOSIS BY LABORATORY EXAMINATIONS. By John A. Kolmer, M.S., M.D., Professor of Medicine in the School of Medicine of Temple University. Second Edition. Appleton - Century - Crofts, Inc., New York. 1949.

This book is probably the best single reference of its kind. By properly correlating laboratory and bedside medicine, it unifies these two points of view which are so often erroneously considered independent of one another. A full knowledge of the contents is of inestimable value to the physician in present-day medicine.

This second edition has been heavily revised to interpret and apply the most modern technical procedures. Noteworthy is the reorganization of diagnostic concepts of liver disease. The improved immunological studies include the Rh and Hr blood factors and the anti-Rh agglutinins and blocking antibodies related to pregnancy and blood transfusions.

These revisions have been accomplished without increasing the size of the volume, which contains three sections pertaining to laboratory examinations; the clinical interpretations; the practical applications, and a few of the more common technical procedures. A listing of the diagnostic summary tables and an improved index facilitate reference.

* * *

MODERN PRACTICE IN ANAESTHESIA—1949. Edited by Frankis T. Evans, M.B.B.S., Honorary Anaesthetist, St. Bartholomew's Hospital, London. Paul B. Hoeber, Inc., New York, 1949. $12.50.

This book contains a brief history of the early pioneers in anesthesia, followed by a chapter on anatomy for the anesthetist. This chapter is brief and interesting and is written for a practical application to general anesthesia rather than regional blocks. A chapter on physiology of anesthesia deals with the gas laws and physiology of respiration and the circulatory system; also the nervous system.

The chemistry of oxygen, nitrous oxide, ether, chloroform, ethyl chloride, trichlorethylene, the barbiturates and curare are presented clearly and briefly. These agents are also discussed in detail as to their use under clinical conditions.

Various regional procedures are discussed and described in general, as in endotracheal technique. Chapters on preoperative preparation and on operative and postoperative complications and care are well presented.

Techniques for special operations such as thoracic surgery, oral surgery, bronchoscopy, neurosurgery, etc., are included and presented by various authors.

Administration of blood and blood substitutes are presented and also a chapter on the treatment of shock and administration of anesthetics to the shocked patient.

The book as a whole touches on most problems of interest to the anesthetist in a diversified anesthesia service. The various authors present their own methods of meeting various problems and the ones which in their hands give the better results. A study of this book by many of Great Britain's outstanding anesthetists should prove an excellent substitute for a visit to observe the work of the various authors in person. Every American interested in anesthesiology should find it of value.

California
MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION
© 1950, by the California Medical Association
VOL. 72 JUNE 1950 No. 6

The Effects of Cortisone and Adrenocorticotropic Hormone (ACTH) on Certain Rheumatic Diseases

EDWARD W. BOLAND, M.D., *Los Angeles*

SUMMARY

The adrenal cortical hormone, cortisone, and the pituitary adrenocorticotropic hormone (ACTH) possess potent antirheumatic properties. Their administration produces strikingly beneficial effects on a number of rheumatic diseases including rheumatoid arthritis, rheumatoid (ankylosing) spondylitis, acute rheumatic fever, disseminated lupus erythematosus, periarteritis nodosa, psoriatic arthritis, dermatomyositis, and gout. In general the effects of these substances are temporary and they cause suppression rather than cure of the disease processes. Improvement is maintained usually only by continuing administration, and on hormonal withdrawal prompt or fairly prompt relapse of the disease manifestations ensues. In addition to their antirheumatic effects cortisone and ACTH influence a wide variety of physiologic functions. Administration of them therefore may produce a number of metabolic and clinical changes, some of which are not advantageous from a therapeutic standpoint. Adverse side-reactions are more liable to occur when large doses of the hormones are given for prolonged periods; such reactions appear to be reversible and disappear when administration of the hormones is stopped. With cortisone, comparatively few untoward signs develop when smaller amounts are administered continuously even for periods of months.

Greater clinical experience is needed before optimal doses and schedules of administration are finally determined. It appears that some severe cases, many moderately severe cases, and most moderate and mild cases of rheumatoid arthritis may be adequately controlled with smaller "maintenance" doses of cortisone ranging from 32 to 65 mg. a day, providing larger doses to suppress the disease manifestations are employed initially.

Neither cortisone nor ACTH should be considered as a therapeutic agent for general use until more information regarding their physiologic activities and the consequences of prolonged or repeated administration of them are available. Until the potential dangers of these hormones can be determined precisely, the use of them should be considered as an investigative procedure.

ALTHOUGH some rheumatologists have suspected that certain rheumatic diseases might be influenced by the function of the endocrine glands, no direct clinical or experimental evidence was available to support this consideration. Their ideas remained poorly defined until recently when Hench, Kendall, Slocumb and Polley, and subsequently others, demonstrated that the adrenal cortical hormone, cortisone (Compound E), and the adrenocorticotropic hormone from the anterior pituitary gland, ACTH, exert strikingly beneficial effects on a number of rheumatic diseases.

That cortisone and ACTH possess potent anti-

Presented as part of the Symposium on the Adrenal Cortex before the Section on General Medicine at the 79th Annual Session, San Diego, April 30-May 3, 1950.

rheumatic properties was not a chance discovery. The trial of these substances in patients with rheumatoid arthritis and allied diseases was prompted by deductions drawn from clinical observations. Rheumatoid arthritis is capable of spontaneous regression and not infrequently the course of the disease may be interrupted by spontaneous remissions, partial or complete, temporary or permanent. The disease, therefore, has the inherent capacity of spontaneous reversibility although this potentiality often remains dormant.[19] Certain procedures heretofore considered to be unrelated in their modes of action are known to stimulate, although feebly, the potential reversibility of rheumatoid arthritis and thereby to induce temporary amelioration of the disease. These procedures include febrile reactions from foreign proteins, starvation, surgical procedures, and surgical anesthesias. Much more potent and more regular antagonists of rheumatoid arthritis are pregnancy and jaundice from biliary obstruction or hepatitis.[16, 17] Although the relief from these various procedures and states appeared to be produced in diverse and unrelated ways, Hench speculated that a common mechanism might exist. Further, he was unable to reconcile the microbic theory of etiology with the powerful ameliorative influence of jaundice and pregnancy, states which are not known to influence favorably the course of proved bacterial or viral infections. If the agent which produced articular relief in jaundice were closely related or identical to the agent responsible for relief in pregnancy, Hench reasoned that the responsible substance must be common to both sexes and that it was not a unisexual factor. He conjectured that a bisexual hormone, possibly a hormone from the adrenal cortex, might be involved in the curious antirheumatic effect of pregnancy and jaundice.

In September 1948, Hench, Kendall, Slocumb and Polley administered cortisone to a patient with severe rheumatoid arthritis; striking and rapid improvement in the clinical and laboratory features of the disease resulted. In April 1949 these investigators reported dramatically favorable effects on severe or moderately severe rheumatoid arthritis from cortisone in 14 patients and from ACTH in two patients.[20] Subsequently cortisone and/or ACTH have been found to be beneficial in other rheumatic diseases, including to date acute rheumatic fever, rheumatoid (ankylosing) spondylitis, disseminated lupus erythematosus, periarteritis nodosa, psoriatic arthritis, dermatomyositis, and gout.

Certain experiments in animals also suggested that adrenocortical function may be related to rheumatic disease. In 1944 Selye and his co-workers observed that rats with intact adrenal glands occasionally developed joint lesions, similar histologically to the articular changes of rheumatic fever, when large doses of desoxycorticosterone were given.[41] The arthritis was transient, tending to disappear within a few weeks in spite of continued administration, and it developed in only a small percentage of the rats so treated. Other alterations of a "rheumatic type," such as arteritis simulating periarteritis nodosa, myocarditis with Aschoff body formation and encephalitis, occurred more regularly. When overdoses of desoxycorticosterone were given to adrenalectomized rats, the joint manifestations developed more frequently and the extra-articular changes were more pronounced. Since the discovery that cortisone and ACTH favorably influence certain rheumatic diseases, Selye attempted to explain this observation:[40] The action of desoxycorticosterone may be antagonized by glucocorticoids (cortisone-like steroids. Adrenalectomy may sensitize the animal to the toxic effects of desoxycorticosterone by removing the endogenous source of glucocorticoids. Thus in adrenalectomized animals rheumatic lesions are produced more frequently with overdoses of desoxycorticosterone.

Recently Selye reported observations on the influence of anterior pituitary and adrenal cortical hormones on experimentally induced non-specific chemical arthritis.[40] By injecting dilute solutions of formaldehyde in the hind paw of animals, acute arthritis and periarthritis were produced in the adjacent joints. When large or repeated doses of formaldehyde were injected, chronic arthritis and periarthritis developed; these were self-maintaining proliferative changes which continued for weeks after the irritant was discontinued, and microscopically the lesions resembled those found in the "chronic stage of rheumatoid arthritis." The arthritis was intensified if the rats were given either desoxycorticosterone or crude lyophilized anterior pituitary extract for several days beforehand. Conversely, pretreatment with either cortisone or ACTH almost completely inhibited the development of "formalin arthritis." Furthermore, experimentally produced alarm reactions (forced exercise, exposure to cold, spinal cord transection, starvation) inhibited the development of articular reactions from formaldehyde. The preventive effect of severe stress was interpreted as due to increased endogenous secretion of ACTH and hence of glucocorticoids. Adrenalectomized animals subjected to similar stresses were not so protected. Deductions were drawn that the inhibitory actions of ACTH, cortisone, and alarm reactions were due to the direct effect of cortisone-like glucocorticoids upon the injured tissues. Selye suggested that the antiarthritic effects of ACTH and cortisone are probably non-specific in nature rather than disease-specific.

The known hormones derived from the adrenal cortex may be classified broadly according to their principal functions as follows: (1) electrolyte regulating steroids; (2) carbohydrate regulating steroids (glucocorticoids), and (3) sex-like steroids (principally androgenic). Cortisone (Compound E) belongs to the group of carbohydrate-regulating hormones, along with Compounds A (11-dehydrocorticosterone), B (corticosterone), and F (17-hydroxycorticosterone). Cortisone and Compound F are the most active of the carbohydrate-regulating hormones derived from the adrenal cortex.

In 1946 Sarett at the Merck Laboratories, working in cooperation with Kendall and his colleagues at the Mayo Clinic, accomplished partial synthesis of cortisone from a bile acid (desoxycholic acid).[24] The product, although still scarce and expensive, is now being produced synthetically in sufficient quantity to allow limited clinical evaluation.

From 1936, when Kendall and his colleagues first isolated the hormone from extracts of the adrenal cortex,[25, 31] until its synthetic production in 1946, only minute quantities of cortisone were available for research in animals. Yet, in spite of its scarcity, important facts regarding its physiologic activities were determined, some of which may be summarized as follows: Cortisone (1) influences carbohydrate and protein metabolism, inducing (under certain experimental circumstances) hyperglycemia, glycosuria, and negative nitrogen balance; (2) affects the metabolism of electrolytes (although relatively feebly); (3) maintains life in adrenalectomized animals; (4) produces lysis of lymphocytes and eosinophils; (5) increases the resistance of adrenalectomized animals to the various stresses; (6) depresses adrenal cortical function with resulting decrease in 17-ketosteroid excretion; (7) produces atrophy of the adrenal and thymus glands, lymph nodes, and spleen; (8) increases antihyaluronidase activity; (9) increases the muscle work capacity of adrenalectomized animals; (10) produces regression of certain malignant mouse tumors.

Adrenal cortical function is regulated mainly by the function of the anterior pituitary gland through the medium of its adrenocorticotropic hormone (ACTH). ACTH, a complex protein substance with a molecular weight of nearly 20,000, was isolated in pure form in 1943 by Li and collaborators[27] and by Sayers and co-workers.[39] More recently Li has demonstrated that the active adrenocorticotropic principle is contained in a less complex peptide fraction of ACTH.[26, 28] Supplies of the hormone are dependent upon extraction from animal pituitary gland tissue, and because of its protein structure the prospects for its synthesis in the near future are remote. Although scarce, the supply of ACTH has been sufficient to allow fairly extensive experimentation in animals and limited clinical trials in human subjects.

The administration of ACTH to animals and humans with responsive adrenal glands results in increased secretion of glucocorticoids, some of which are closely allied to cortisone, and also in increased secretion of other cortical hormones such as those which influence electrolyte metabolism and androgenic function. Thus the administration of ACTH produces in general the following results: (1) affects carbohydrate and protein metabolism (inducing hyperglycemia, glycosuria, and negative nitrogen balance); (2) alters electrolyte metabolism, causing increased excretion of potassium and decreased excretion of sodium; (3) reduces the alkaline phosphatase content of plasma; (4) promotes hematologic changes which include reduction in total eosinophil and lymphocyte counts, increase in circulating neutrophils, and atrophy of lymph nodes; (5) causes prompt and greatly increased excretion of both 11-oxysteroids and 17-ketosteroids; (6) enhances the excretion of uric acid; and (7) augments antihyaluronidase activity. In patients with Addison's disease or in adrenalectomized animals these effects are not provoked. When ACTH is given to animals adrenal cortical hypertrophy may result[36] and the cholesterol and ascorbic acid contents of the gland are quickly reduced.[37, 8, 38] The depletion of cholesterol suggests that this substance may be utilized in the formation of steroid hormones.[11] The relationship between ascorbic acid and the cortical steroids is not definitely established but the gland's sensitive ascorbic acid response is used as a means of bioassaying the potency of ACTH.

INFLUENCE OF CORTISONE AND ACTH ON RHEUMATIC DISEASE

It has been estimated that in America up to January 1, 1950, approximately 160 patients with rheumatic disease had been given cortisone and about 175 had received ACTH.[13] The data included herein are based upon studies (some still unpublished) which have been made on many of these patients, and also upon personal experiences with 62 rheumatic patients to whom the author has administered cortisone.

RHEUMATOID ARTHRITIS

The dramatic response of rheumatoid arthritis to cortisone and ACTH, as first described by Hench, Kendall, Slocumb and Polley, has now been confirmed by several investigators.[4] The experiences have been practically uniform and each group of observers has found that patients with the disease in its various manifestations improved promptly and greatly with administration of the hormones. All observers have agreed that while these substances exert a pronounced suppressive effect, their influence is not curative but temporary, and in most instances exacerbations of the disease result when administration of the hormones is stopped. Hench and co-workers[21] recently reported their general results in 23 patients with rheumatoid arthritis who received cortisone or ACTH, or both, in large doses for total periods ranging from 11 to 218 days. The antirheumatic response was 90 to 95 per cent relief of disability in 14 patients, 75 to 90 per cent relief in eight patients, and moderate relief in one patient.

Response of Articular Manifestations to Cortisone and ACTH

A fairly definite pattern of improvement is noted with cortisone administration. Within a few days (or hours in some cases) there is pronounced reduction in stiffness of muscles and joints, lessening of articular aching, tenderness, and pain on motion, and significant improvement of articular and muscular function. Usually the first symptoms to subside are muscular and articular stiffness and rest pain, and within one to four days the patients may have no further desire for acetylsalicylic acid or other analgesics. Next in order of improvement are lessening of joint pain on motion, increased motion and decreased tenderness of the joints. Reductions in articular swellings are usually slower in appearing and may not be complete, but sometimes swellings and effusions recede rapidly and completely. Within seven to ten days mild flexion deformities may be corrected. In spite of advanced muscle atrophy and previously restricted joint motion, muscle strength and joint function may return to a remarkable degree within a few days. In early and less severe cases, complete remissions may ensue with disappearance of all abnormal physical signs. In severe cases and in cases of longer standing, some articular swelling and effusion, together with some tenderness, may persist even when relatively large doses of the hormone are given for prolonged periods. Destructive changes in cartilage and bone, fixed deformities, and ligamentous calcification are not changed. Non-articular features, such as subcutaneous nodules, enlarged lymph nodes, bursitis, and tenovaginitis improve or disappear along with the improvement in the joints.

Prompt and significant improvement in the musculoskeletal manifestations, similar qualitatively to that resulting from cortisone, occurs with the administration of ACTH in adequate doses.* Striking reductions in stiffness, pain, articular tenderness and swelling are noted within a few days. As with cortisone, the beneficial effects are usually temporary and the manifestations of the disease revert to their original intensities, often promptly, after withdrawal of the hormone.

Influence on Constitutional Symptoms

A definite sense of well-being is exhibited by most patients during administration of cortisone or ACTH, the degree of mental stimulation varying somewhat with the size of the daily dose given. Some patients who are initially depressed and pessimistic become frankly euphoric. Because the psychologic response is often greater than would be anticipated merely from pain relief and improvement in the physical condition, it appears that these hormones may have a positive euphoristic action. Other effects on constitutional symptoms include: Loss of "toxic feeling," increased general strength and endurance, and change in libido (increase in some, decrease in others) in males. Patients who are febrile usually become afebrile within 24 to 72 hours and remain so during the period of administration. Appetites tend to improve rapidly and corresponding increases in food consumption, general nutrition, and body weight are noted. Such weight gains as 19 pounds in 40 days, 21 pounds in 60 days, 26 pounds in 60 days, and 41 pounds in 218 days have been recorded.[20, 21, 7]

Influence on Laboratory Tests

Erythrocyte sedimentation rates: Significant decreases in the erythrocyte sedimentation rate occur usually within a few days after cortisone or ACTH administration is started; the decreases occur promptly and rapidly in some patients, more slowly in others. With cortisone in daily doses of 100 mg., the rates ordinarily decrease at a speed of about 2 to 4 mm. per hour from one day to the next, but in some the correction is more rapid, proceeding with a daily average reduction of 4 to 7 mm. per hour;[20] frequently rates become normal within ten to 35 days. With short-term administration of cortisone, decreases varying from 15 to 75 mm. may be noted within periods of eight days.[6] Even more prompt and more steady decreases in rates may result from the administration of large doses of ACTH.[20, 21]

Erythrocyte counts and hemoglobin determinations: When anemia is present, erythrocyte counts may increase by 500,000 to 1,000,000 cells per cu. mm., and hemoglobin determinations may increase by 1.4 to 2.0 gm. per 100 cc. within a few weeks.[20] Even with short-term administration, pronounced improvement in the erythrocyte count and hemoglobin value may be noted.[6]

Leukocyte counts: Small, but significant, increases in the total number of circulating leukocytes may be noted during prolonged administration of cortisone. Consistent changes in the number of lymphocytes or eosinophils usually do not occur.[43, 21] When ACTH is given in doses of 100 mg. daily, complete or almost complete disappearance of circulating eosinophils usually results.[45]

Articular biopsies: When performed after several weeks of cortisone or ACTH administration, articular biopsies reveal definite reductions of synovial inflammation, but the synovial tissues are still not normal. Microscopic findings include a decreased number of plasma cells and lymphocytes, reduction of papillary tufting, reduced deposition of fibrin, and lessened necrosis and edema.[20, 21]

Electrocardiograms: Except for slowing of the heart rate, no significant changes are noted as the result of cortisone administration.[6]

Electroencephalograms: Changes in the electroencephalographic pattern have been observed with both cortisone and ACTH administration,[6, 32] but the full significance of these alterations has not yet been reported.

Corticosteroid excretion:[43, 20] Urinary concentrations of corticosteroids are increased initially when large doses (100 to 200 mg.) of cortisone are given. With continued administration of 100 mg. daily, the amount excreted may remain elevated or decline toward control values. The increased urinary concentrations probably represent the excretion of unchanged cortisone (a corticosteroid) and metabolites of cortisone which give the same chemical reactions as corticosteroids.[21] ACTH promotes prompt and pronounced increased corticosteroid excretion. Thirty to 50 per cent of the total amount excreted consists of Compound F (17-hydroxycorticosterone), indicating that ACTH may stimulate the adrenal cortex to form Compound F rather than cortisone.

---

*See References 20, 13, 42, 30, 23, 3, 32.

17-ketosteroid excretion:[43, 20, 21] When cortisone is given in daily doses of 100 mg., the daily excretion of 17-ketosteroids is reduced at first and later increased, but it remains less than the pre-cortisone level for as long as cortisone is given and for some time thereafter. When the daily dose is increased from 100 mg. to 200 mg., the excretion of 17-ketosteroids increases sharply and may surpass the pre-cortisone amounts. Hench, Kendall, Slocumb and Polley[21] make the following interpretation: The administration of cortisone promptly depresses adrenal cortical function so that the cortex produces smaller amounts of those steroids (among them cortisone) which are precursors of 17-ketosteroids—thus the excretion falls. But the catabolism of injected cortisone involves the production of small amounts of 17-ketosteroids—hence after an initial fall the total daily excretion increases somewhat. With very large doses (200 mg. daily) of cortisone, the amount of injected material which is catabolized to 17-ketosteroids may more than compensate for the suppressed function of the adrenal cortex.

Administration of ACTH stimulates adrenal cortical function and causes pronounced increases in 17-ketosteroid excretion.

Plasma electrolytes:[43, 32] Cortisone given in doses of 100 mg. daily does not cause significant alterations in the balance for sodium, potassium, and chloride, or in the concentrations of electrolytes in the extracellular fluid. But with daily doses of 200 mg. cortisone regularly induces a negative balance for potassium. The long range effects of such large doses on excretion of sodium and chloride are variable; the most common are retention of these ions early, followed later by increased excretion. ACTH in doses of 100 mg. daily produces a negative balance for potassium. At first there is marked retention of sodium and chloride, then later these ions may be excreted in increased amounts.

Urinary total nitrogen: [43, 32] Nitrogen excretion is not changed significantly when the dose of cortisone is 100 mg. daily, but it is decidedly increased when the dose is 200 mg. daily. A negative nitrogen balance occurs during ACTH administration in large doses (100 mg.) but nitrogen excretion may fall to control levels when the daily dose is lowered.

Uric acid in serum and urine:[43, 32] Uric acid excretion is only slightly increased with the administration of 100 mg. of cortisone daily. The excretion is moderately increased with ACTH in daily doses of 100 mg. Significant decreases in serum uric acid occur most commonly with ACTH or cortisone when initial serum uric acid levels are in the upper normal range or above normal.

Carbohydrate tolerance:[32, 6, 43, 21] Slight inconstant increases in the fasting blood sugar have been observed in some cases during administration of cortisone or ACTH, but rarely have the values exceeded normal. In most cases glucose tolerance tests are not altered conspicuously during cortisone administration although several patients have shown slightly decreased tolerances. The tolerance was reduced sufficiently to produce diabetic curves in two cases studied by the author. Yet with continued administration of cortisone neither glycosuria nor clinical evidence of diabetes developed. In normal subjects given large doses of ACTH, some investigators have found that a temporary state of metabolism similar to that of diabetes mellitus could be caused;[10, 9] impairments of carbohydrate tolerance so induced have been reversible and have disappeared after withdrawal of the hormone.

Serum proteins:[43, 32, 20, 21] The effect of cortisone and ACTH is to increase serum albumin and decrease serum globulin if the pretreatment values of these substances are abnormal.

Sensitized sheep cell agglutination:[32] This reaction remained positive in seven of eight patients treated with ACTH; in one patient a positive agglutination changed to a doubtful reaction.

Course After Discontinuance of Cortisone and ACTH

In most instances clinical improvement is sustained only by continuing administration, and cessation of the hormones results, as a rule, in prompt or fairly prompt relapse of the disease. In eight of nine cases reported by Hench, Kendall, Slocumb and Polley[20] in which cortisone was discontinued after short-term administration, the symptoms and signs began to return within two to four days after withdrawal of the compound; the return progressed slowly in six cases and rapidly in two. In the remaining one case most of the improvement was retained five months after the drug was stopped. In seven of eight cases observed by Boland and Headley[6] relapse occurred on withdrawal of the medication, and within four weeks the clinical and laboratory manifestations had returned to their original intensities; in one case 75 per cent of the initial improvement was retained. As with cortisone, withdrawal of ACTH is usually followed by rapid return of symptoms.[20, 32, 45, 35, 13, 23]

Adverse Physiologic Effects Induced by Cortisone and ACTH

Cortisone and ACTH are potent hormones which are capable of influencing a wide variety of physiologic functions. While they exert strikingly beneficial action on certain rheumatic and other diseases, undesirable metabolic and clinical signs of adrenocortical hyperfunction may attend their use. In varying combinations these adverse effects have included:[21, 7, 43, 20, 5] (1) signs of altered fluid balance such as edema, sudden gains in weight, polydipsia and oliguria; (2) rounding of the facial contour, probably due to localized deposition of adipose tissue; (3) signs of increased androgen activity such as acne and mild hirsutism; (4) changes in libido, potentia, and menstruation (irregular menses or amenorrhea); (5) nervous system effects such as euphoria, nervousness, insomnia, changes in mood or psyche, paresthesias, and functional symptoms of psychoneurosis; (6) cutaneous striae; (7) weakness, fatigue and exhaustion; (8) impaired carbohydrate tolerance; (9) alkalosis with lowered blood potassium levels; (10) miscellaneous effects such as transient headaches, dizziness or light-headedness, transient blurring of vision, thinning of the hair, and pigmentation of the skin (especially of the face and neck).

Adverse side-effects are usually mild, are reversible, and disappear when administration of the hormones is stopped. They are commonly encountered when large doses (100 mg. daily or more) are given for long or fairly long periods. Of 23 patients studied by Hench and associates,[21] most of whom received large doses of cortisone or ACTH for long periods, side-effects developed in 14 (61 per cent). They were mild in eight (35 per cent), moderate in two (9 per cent), and pronounced in four (17 per cent). Of nine patients treated by Bauer with large doses of cortisone (100 to 150 mg. daily for eight to 12 days) and ACTH (75 to 200 mg. daily for 12 days to four months), undesirable side-reactions were observed in "almost all patients."[13] Freyberg[14] noted no serious complications with 17 patients who received cortisone or with 16 who received ACTH, and some were treated for periods as long as 160, 150, 145, and 120 days. Untoward changes are more liable to occur in females than in males, presumably because of their more complex hormonal mechanisms.[7, 21, 13]

Whereas individual tolerance may play some role in the development of side-effects, the chief factors appear to be dosage and length of administration. In the author's experience with cortisone, adverse signs have been noted usually in those patients receiving large doses (such as 100 mg. or more daily). In an attempt to avert or minimize the development of hypercortisonism it has been the author's practice to give initial large doses only for a period long enough to produce satisfactory suppression of the disease. The dosage is then gradually reduced until the smallest daily amount is reached which will sustain adequate control. When the rheumatic manifestations can be controlled with maintenance doses averaging 32 to 65 mg. daily, comparatively few side-effects of the hormone have been encountered. Although such smaller doses have been continued with but few untoward reactions for more than four months in a number of patients, it is possible that undesirable signs might develop after more prolonged administration.

Signs of hormonal excess from cortisone or ACTH have been sufficient in several cases to produce clinical pictures of Cushing's syndrome. Hench, Kendall, Slocumb and Polley described one such case in their first report.[20] The patient was a 29-year-old female who, after receiving cortisone in daily doses of 100 mg. for a period of six months, developed acne, mild hirsutism, moon-like face, amenorrhea, mental depression, and impaired carbohydrate tolerance. The manifestations were temporary, however, and disappeared when the hormone was discontinued.

Decreases in carbohydrate tolerance, as measured by glucose tolerance tests performed before and during administration of cortisone, have been observed in a few patients;[6] but in most instances no significant changes have been found even after prolonged administration of large doses (100 mg. daily). In two patients with initially normal curves observed by the author, the tolerance decreased during administration to the extent that diabetic types of curves developed.[7] Administration of cortisone was continued in both patients, and their usual diets were maintained; yet in neither have glycosuria or clinical signs of diabetes appeared. More striking changes in carbohydrate tolerance might be expected if the hormone were administered to individuals having latent or frank diabetes mellitus. One of the first patients treated by the author had coexisting diabetes mellitus and rheumatoid arthritis, and the diabetes was temporarily intensified during the administration of cortisone (200 mg. daily for two days, then 100 mg. daily for six more days.)[6] The daily insulin requirement before cortisone was 10 units and during the use of cortisone was between 30 and 50 units while the patient remained on a constant measured diet. Three days after withdrawal of the hormone the insulin requirement reverted to the pre-cortisone amount of 10 units.

The potential dangers from the use of either cortisone or ACTH cannot yet be fully appraised and further studies are needed before the limitations of prolonged administration can be assessed. Some observers have expressed apprehension that administration of these hormones for periods of months or years might result in persistent adrenal cortical hyperplasia from ACTH on the one hand, and persistent atrophy from cortisone on the other;[22] but so far all adverse effects have been temporary, have disappeared on hormonal withdrawal, and no evidence for permanent damage has been offered. Until the dangers can be determined precisely, however, the use of these hormones should be considered as an investigative rather than a therapeutic procedure.

Dosage and Schedule of Administration of Cortisone and ACTH

Greater clinical experience with these hormones and more knowledge about their physiologic activities and more information regarding the consequences of their prolonged or repeated administration are needed before optimal dosages and best schedule of administration can be determined. Milligram for milligram, cortisone and ACTH do not have physiologic equality.[21] Approximately one-half as many milligrams of ACTH as cortisone are needed to produce the same clinical effect, or in other words 100 mg. of ACTH stimulate the adrenal cortices to produce about 200 mg. of cortisone-like steroids. Because ACTH is rapidly absorbed and utilized, the best results are obtained by giving the total dose in divided doses two to four times daily. Cortisone is absorbed more slowly and one injection a day (or every second day in some cases) is sufficient.

To accomplish remissions in adults with severe or moderately severe rheumatoid arthritis Hench, Kendall, Slocumb and Polley found that daily doses of 100 mg. of cortisone acetate were required.[20] Most of their patients were given 300 mg. on the first day and thereafter 100 mg. daily. Doses of 75 mg. daily were usually less than completely effective in severe cases, and smaller doses of 25 or 50 mg. were inadequate or totally ineffective. Of ACTH they generally gave 100 mg. daily but in some cases the daily dose varied from 45 to 140 mg.[21] Other observers have obtained good results with daily doses of ACTH ranging from 20 to 100 mg.[45,32,35,23] In Holbrook's experience[23] ACTH in total daily doses of 40 mg. was usually effective, while Ragan and colleagues[32] held two patients under satisfactory control with doses of 10 or 15 mg. given twice daily.

In an attempt to avert undesirable side-effects various schedules have been tried. Hench and coworkers[21] have suggested that interrupted administration or a "course method" might provide a more physiologic response than would continuous administration to the limits of individual tolerance. A few of their patients who were treated intermittently, or with intermittent but alternating courses of ACTH and cortisone, have experienced temporary secondary rebound remissions. In other words, on withdrawal of either cortisone or ACTH an initial short relapse occurred which was then followed by a second remission. This suggested to them that remissions resembling spontaneous ones might be produced in some cases by interrupted therapy.

The author, too, has tried to find a method which would eliminate or minimize adverse effects and yet preserve therapeutic effectiveness. With cortisone it has been possible to maintain improvement with smaller doses in the majority of patients with rheumatoid arthritis providing the disease manifestations have first been suppressed with larger doses given initially. With continued administration of smaller daily maintenance doses, control of the manifestations has usually been adequate although not always as complete as with larger daily doses. But it is probably more prudent to control patients adequately with smaller doses than to attempt to obtain complete or absolute results with large and probably unsafe amounts of the hormone.

The procedure followed by the author in severe and moderately severe cases is, at present, to give 200 mg. of cortisone on the first day and then 100 mg. daily thereafter until the clinical manifestations have improved satisfactorily and the erythrocyte sedimentation rate has reached, or is approaching, a normal value. The time required for this result varies widely from two to six weeks. The dose is then gradually lowered in step-wise fashion until the smallest dose is found which will control the clinical manifestations. If significant side-effects occur during the initial period when larger doses are being given, the dosage is reduced sooner. Some severe and many moderately severe cases have been controlled adequately on daily doses averaging from 50 to 65 mg. For mild and moderate cases the same procedure is adhered to except that only 100 mg. is given on the first day; the time needed to suppress the disease is usually shorter than with severe cases and dosage can be decreased earlier. Most mild and moderate cases have been controlled adequately, some completely or almost completely, with doses averaging 32 to 50 mg. per day. Doses of 100 mg. given every other day appear to be as effective as doses of 50 mg. given daily. Many patients have been maintained satisfactorily with doses of 100 mg. given three times a week. Details of these observations will be published elsewhere.[7]

JUVENILE RHEUMATOID ARTHRITIS (STILL'S DISEASE)

Juvenile rheumatoid arthritis responds in the same way as the adult form to cortisone and ACTH.[13,23,12,35] The details of two cases were reported by Elkinton and collaborators.[12] A five-year-old boy, treated with 25 mg. of ACTH daily for seven days, became afebrile within 12 hours, and within 48 hours the painful joint swellings had subsided for the most part. A nine-year-old girl, given ACTH intermittently and in varying doses over a period of 152 days, demonstrated dramatic clinical improvement during each period of administration, but with daily doses of 50 to 60 mg., signs of hyperadrenalism developed. Adequate dosage of these hormones in children apparently depends more on the severity of the disease than on body size. As much may be needed for adequate antirheumatic response as in an adult, but the metabolic and endocrine complications may be greater in the child because of the larger ratio betwen hormone dose and body size.[13]

RHEUMATOID (ANKYLOSING) SPONDYLITIS

Results similar to those obtained in peripheral rheumatoid arthritis have been produced by cortisone and ACTH in patients with typical rheumatoid (ankylosing) spondylitis. Temporary remissions were provoked in each of six patients treated by Freyberg with cortisone.[13] Holbrook gave ACTH in doses of 40 mg. daily for ten to fourteen days to four spondylitic patients and each was decidedly improved.[23] One patient retained 75 per cent of the improvement for three months, whereas exacerbations occurred promptly in the remaining three patients when the hormone was discontinued.

RHEUMATOID ARTHRITIS WITH PSORIASIS

A few patients with rheumatoid arthritis and coexisting psoriasis have been given ACTH or cortisone. The articular response has not differed from that observed in uncomplicated rheumatoid arthritis, and in each instance there has been concomitant improvement in the psoriatic skin lesions.[18, 23, 35, 7] A patient with severe psoriasis and moderately severe psoriatic arthritis was treated with cortisone (100 mg. daily for 43 days) and later with ACTH (3.5 gm. within 28 days).[21] During each course the arthritis disappeared promptly, but the psoriasis improved slowly: "Remissions, not cures, were induced."

ACUTE RHEUMATIC FEVER

The favorable influence of cortisone and ACTH on acute rheumatic fever has been reported by several investigators. The group at the Mayo Clinic[21, 2, 1] has given cortisone during the acute phase of the disease to seven patients and ACTH to four others. The doses of cortisone were 200 mg. for the first few days, then 100 mg. daily. Total doses of 3.45 to 5.2 gm. were given for periods of 22 to 40 days. Initial doses of ACTH were 25 to 60 mg., then later 10 to 15 mg. daily, with total doses of 400 to 825 mg. within 16 to 38 days. Rapid disappearance not only of fever, tachycardia, and polyarthritis, but also of sedimentation rate acceleration and electrocardiographic abnormalities, resulted. Fever subsided within one to six days and the joints became symptom-free within two to eleven days. Sedimentation rates were refractory for the first two to five days and then decelerated rapidly; decreases as great as 100 mm. in one hour were noted within periods of 10 to 14 days and the rates in seven of the eight cases became normal within 20 days. Prolonged P-R intervals in five patients were restored to normal within one to eleven days. In three of the eight cases mild rheumatic recurrences appeared within two to six weeks, but these subsided when the hormones were given again and then did not reappear. Cardiac examinations made eight to ten months following the attacks revealed no evidence of new, or increased old, rheumatic carditis. Although no definite conclusions were drawn, it was hoped that rapid termination of the process with cortisone or ACTH might prevent or lessen the development of chronic sequelae in the heart valves and myocardium.[20] Thorn and collaborators[45] treated three patients with ACTH in doses of 40 mg. daily for periods ranging from eight to fourteen days; detailed results were not given but the response was said to be more striking than that obtained with ACTH in rheumatoid arthritis.

PERIARTERITIS NODOSA

Three patients with periarteritis nodosa were treated by Ragan and co-workers with ACTH, and in each there was subsidence of the activity.[32] Such manifestations as purpuric rashes, pruritus, asthma, periarteritic nodules and eosinophilia disappeared or were greatly reduced in severity, but recurred when the hormone was discontinued. A patient with histologically proved periarteritis nodosa was successfully treated with cortisone:[7] Periarteritic nodules, skin rash, joint swelling and tenderness disappeared, the erythrocyte sedimentation rate reverted to normal, and electrocardiographic changes were considerably reduced. After the disease was suppressed by daily doses of 100 mg., improvement was maintained by smaller daily doses of 40 to 50 mg.

DISSEMINATED LUPUS ERYTHEMATOSUS

Pronounced clinical improvement was noted in three patients with acute disseminated lupus erythematosus during the administration of ACTH in daily doses of 40 mg.[45] Two patients were treated with ACTH by Elkinton and associates.[12] One patient, given daily doses of 100 mg., became afebrile within 16 hours and the cutaneous lesions cleared within 14 days. Progressively smaller amounts of the drug were then given and finally after 51 days it was discontinued. The patient remained in "fairly complete remission" 60 days after the hormone was discontinued. The other patient had severe and apparently terminal disease with multiple visceral changes. Seventy-five to 160 mg. of ACTH was given daily, and striking improvement resulted, with fall in temperature, clearing of retinopathy, disappearance of pleural effusion, and diminution of the hepatosplenomegaly. The patient finally became refractory to the agent, however, and the manifestations returned after 44 days of treatment. Despite doses of 200 mg. daily, the patient died.

Hench and colleagues[21] gave cortisone or ACTH to six patients with severe disseminated lupus erythematosus. One patient received cortisone (usually 100 mg. daily) continuously for 166 days; arthritis, pericarditis, pleurisy, leukopenia, and "lupus erythematosus cells" in sternal bone marrow disappeared. The sedimentation rate decreased and the general condition improved greatly. When the hormone was discontinued mild relapse involving muscles and joints developed, but after six months much of the improvement was retained.

DERMATOMYOSITIS

A case of severe dermatomyositis in a five-year old boy was treated with three courses of ACTH.[12] After the first two courses, relapse occurred; but after the third and more prolonged course the disease had remained, at the time of the report, in complete remission for 117 days.

TUBERCULOUS ARTHRITIS

Hench and associates[21] tried the effect of cortisone on two patients with proved tuberculous monarthritis involving knee joints in order to determine what "non-specific" influence this hormone might have on joint disease of known bacterial origin. In one case the knee became essentially symptomless but pathologic and bacteriologic evidence of tuberculous arthritis persisted. On interruption of therapy the articular symptoms returned and a second course of cortisone again reduced the symptoms. The response in the other patient was similar. It was concluded tentatively that cortisone "controlled the hyperergic tissue reaction but did not exert a bacteriostatic or bactericidal effect."

OSTEOARTHRITIS

A patient with chronic lymphatic leukemia and coincidental, but symptomatic, primary osteoarthritis, involving especially the knees, was treated with cortisone.[21] Pronounced symptomatic improvement in the articular symptoms resulted. One of the patients with peripheral rheumatoid arthritis treated by the author also had severe symptomatic osteoarthritis of the cervical spine. The administration of cortisone was accompanied by complete disappearance of aching and subjective stiffness of the neck, considerable reduction of pain on forced motion, but little or no lessening of restricted cervical motion. Another patient with moderately severe symptoms and roentgenographic evidence of severe osteoarthritis of the knees obtained neither subjective nor objective improvement from cortisone given in daily doses of 100 mg. for 21 days. Similarly, a patient with severe malum coxae senilis involving one hip obtained no relief.[7]

GOUT

Robinson and co-workers[33, 34] found that when ACTH was given to normal non-gouty subjects there resulted a prompt increase in urate excretion which persisted throughout the injection period and reached a peak on the ninth day. However, there was no accompanying decrease in the blood urate values as determined by the uricase method. Similar results were observed by Thorn and co-workers,[44] who could not account for the increase on the basis of accelerated renal excretion alone, and postulated that the hormone must also increase urate production in normal subjects. ACTH administered to a patient with latent pretophaceous gout and hyperuricemia resulted in prompt increase in urinary urate excretion comparable in magnitude to that seen in normal subjects. In contrast to normal subjects, however, there was a concomitant fall in blood urate levels. Certain calculations led to the deduction that ACTH caused increased production of urates as well as increased clearance by the kidney.

When ACTH is given during an acute attack of gouty arthritis, prompt relief of the acute joint manifestations is produced.[15, 46, 34, 29] A single dose of 50 mg., if given within eight hours of the onset, may suppress an attack for 24 hours or longer; relief usually occurs within a few hours of administration. However, when ACTH is withdrawn the attack usually recurs in the same or other joints. Colchicine given during, or immediately after, treatment of acute gouty arthritis with ACTH was found by some[46] to prevent a renewal of the attack upon withdrawal of ACTH.

Robinson, Conn, Block and Louis[33] and Hellman[15] gave ACTH to gouty patients during interval or latent periods between attacks, and then withdrew the hormone. On withdrawal most of the patients given more than 100 mg. of ACTH during a 24-hour period had an acute episode of gouty arthritis. The attack so provoked was relieved by further administration of ACTH, but again on withdrawal most patients had a renewed attack within a few days. This phenomenon was interpreted by Wolfson[46] as follows: With ACTH withdrawal an 11-oxysteroid lack is produced which precipitates acute gouty arthritis, while by administration of ACTH a state of 11-oxysteroid excess is produced which relieves the attack.

Administration of cortisone in large doses (200 to 300 mg.) produced prompt subsidence of objective and subjective manifestations in two patients with acute gouty arthritis;[7] relief occurred within five hours in one and within 18 hours in the other. As with ACTH, withdrawal resulted in acute recurrences of the attacks. In one case the recurrent episode was again suppressed by a second injection of 300 mg. of cortisone and the attack was terminated without further recurrence by giving progressively smaller daily doses over a period of eight days. In a patient with severe chronic tophaceous gouty arthritis joint tenderness, rest pain, and pain on weight-bearing disappeared within seven days with cortisone in daily doses of 100 mg.; improvement was maintained by giving 100 mg. three times a week, but no change resulted in the size of subcutaneous or osseous tophi even after four months of administration.

2210 West Third St.

REFERENCES

1. Barnes, A. R., and Smith, H. L.: Effect of a hormone of the adrenal cortex (17-hydroxy-11-dehydrocorticosterone: cortisone) and of pituitary adrenocorticotropic hormone (ACTH) on rheumatic fever, Indiana State M. J. In press.

2. Barnes, A. R., and Smith, H. L.: Effects of administration of cortisone and ACTH on patients with acute rheumatic fever, Mod. Concepts Cardiovas. Dis., Feb. 1950.

3. Bauer, W.: Personal communication.

4. Bauer, W., Boland, E. W., Freyberg, R. H., Holbrook, W. P., and Rosenberg, E. F.: Discussions, Proceedings Seventh International Congress on Rheumatic Diseases, May 30-June 3, 1949. In press.

5. Boland, E. W.: Relation of the adrenal cortex to rheumatic disease: A review of some recent investigations, Ann. Rheum. Dis., March 1950.

6. Boland, E. W., and Headley, N. E.: Effects of cortisone acetate on rheumatoid arthritis, J.A.M.A., 141:301-308, Oct. 1, 1949.

7. Boland, E. W., and Headley, N. E.: Unpublished data.

8. Carreyett, R. A., Golla, Y. M. L., and Reiss, M.: Action of gonadotropic hormone and of pituitary corticotropic hormone on cholesterol content of adrenals, J. Physiol., 104: 201-214, Oct. 15, 1945.

9. Conn, J. W., Louis, L. H., and Johnson, M. W.: Metabolism of uric acid, glutathione and nitrogen, and excretion of "11-oxysteroids" and 17-ketosteroids during induction of diabetes in man with pituitary adrenocorticotropic hormone, J. Lab. and Clin. Med., 34:255, Feb. 1949.

10. Conn, J. W., Louis, L. H., and Wheeler, C. E.: Production of temporary diabetes mellitus in man with pituitary adrenocorticotropic hormone; relation to uric acid metabolism, J. Lab. and Clin. Med., 33:651-661, June 1948.

11. Editorial, Some aspects of adrenal cortical function and pituitary-adrenal relationships, Ann. Int. Med., 31:925-931, Nov. 1949.

12. Elkinton, J. R., Hunt, A. D., Godfrey, L., McCrory, W. W., Rogerson, A. G., and Stokes, J.: Effects of pituitary adrenocorticotropic hormone (ACTH) therapy, J.A.M.A., 141:1273-1279, Dec. 31, 1949.

13. Freyberg, R. H.: Effects of cortisone and ACTH in rheumatoid arthritis (Panel discussion), Bull. New York Acad. Med. In press.

14. Freyberg, R. H.: Personal communication.

15. Hellman, L.: Production of acute gouty arthritis by adrenocorticotropin, Science, 109:280-281, March 18, 1949.

16. Hench, P. S.: Analgesia accompanying hepatitis and jaundice in cases of chronic arthritis, fibrositis and sciatic pain, Proc. Staff Meet., Mayo Clin., 8:430-436, July 12, 1933.

17. Hench, P. S.: Effect of jaundice on chronic infectious (atrophic) arthritis and on primary fibrositis: Further observations; attempts to reproduce the phenomenon, Arch. Int. Med., 61:451-480, March 1938.

18. Hench, P. S.: Personal communication.

19. Hench, P. S.: Potential reversibility of rheumatoid arthritis, Proc. Staff Meet., Mayo Clin., 24:167-178, March 30, 1949.

20. Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F.: Effect of a hormone of the adrenal cortex (17-hydroxy-11-dehydrocorticosterone: Compound E) and of pituitary adrenocorticotropic hormone on rheumatoid arthritis; preliminary report, Proc. Staff Meet., Mayo Clin., 24:181-197, April 13, 1949.

21. Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F.: Effects of cortisone acetate and pituitary ACTH on rheumatoid arthritis, rheumatic fever and certain other conditions: A study in clinical physiology, Arch. Int. Med., April 1950. In press.

22. Henly, A. A.: The adrenocorticotropic hormone, Annual Report, West London Hospital, Dept. of Rheumatic Diseases, pp. 18-26, 1949.

23. Holbrook, W. P.: Personal communication.

24. Kendall, E. C.: Some observations on the hormone of the adrenal cortex designated Compound E, Proc. Staff Meet. Mayo Clin., 24:298-301, May 25, 1949.

25. Kendall, E. C., Mason, H. L., Myers, C. S., and Allers, W. D.: Physiologic and chemical investigation of the suprarenal cortex, J. Biol. Chem., 114:57-58, May 1936 (in Soc. Proc.).

26. Li, C. H.: Chemistry of the hormones, Ann. Rev. Biochem., 16:291-322, 1947.

27. Li, C. H., Evans, H. M., and Simpson, M. E.: Adrenocorticotropic hormone, J. Biol. Chem., 149:413-424, Aug. 1943.

28. Luft, R., Sjögren, B., and Li, C. H.: Results of administration of adrenocorticotropically active peptides (ACTH peptides) to a patient suffering from rheumatoid arthritis, Acta endocrinol., 3:299, Dec. 1949.

29. Margolis, H. M., and Caplan, P. S.: Treatment of acute gouty arthritis with pituitary adrenocorticotropic hormone (ACTH), J.A.M.A., 142:256-258, Jan. 28, 1950.

30. Markson, D. E.: Prolonged treatment of rheumatoid arthritis with pituitary adrenocorticotropic hormone (ACTH), J.A.M.A., 141:458-459, Oct. 15, 1949.

31. Mason, H. L., Myers, C. S., and Kendall, E. C.: Chemical studies on the suprarenal cortex. II. The identification of a substance which possesses the qualitative action of cortin; its conversión into a diketone closely related to androstenedione, J. Biol. Chem., 116:267-276, Nov. 1936.

32. Ragan, C., Grokoest, A. W., and Boots, R. H.: Effect of adrenocorticotropic hormone (ACTH) on rheumatoid arthritis, Am. J. Med., 7:741, Dec. 1949.

33. Robinson, W. D., Conn, J. W., Block, W. D., and Louis, L. H.: Role of the adrenal cortex in urate metabolism and gout, J. Lab. & Clin. Med., 33:1473, Nov. 1948.

34. Robinson, W. D., Conn, J. W., Block, W. D., Louis, L. H., and Katz, J.: Role of the anterior pituitary and adrenal cortex in urate metabolism and in gout, Seventh Internat. Congress on Rheumatic Dis., May 30-June 3, 1949, New York.

35. Rosenberg, E. F.: Rheumatoid arthritis: Experiences with cortisone (Compound E), and other adrenal cortical steroids, and pituitary adrenocorticotropic hormone. To be published.

36. Sayers, G., and Sayers, M. A.: Regulation of pituitary adrenocorticotropic activity, Federation Proc., 5:200, March 1946.

37. Sayers, G., Sayers, M. A., Fry, E. G., White, A., and Long, C. N. H.: Effect of adrenotropic hormone of anterior pituitary on cholesterol content of adrenals with review of literature of adrenal cholesterol, Yale J. Biol. & Med., 16: 361-392, March 1944.

38. Sayers, G., Sayers, M. A., Liang, T. Y., and Long, C. N. H.: Effect of pituitary adrenotropic hormone in cholesterol and ascorbic acid content of adrenal of rat and guinea pig, Endocrinology, 38:1-9, Jan. 1946.

39. Sayers, G., White, A., and Long, C. N. H.: Preparation and properties of pituitary adrenotropic hormone, J. Biol. Chem., 149:425-436, Aug. 1943.

40. Selye, H.: Further studies concerning the participation of the adrenal cortex in the pathogenesis of arthritis, Brit. M. J., 4637:1129-1135, Nov. 19, 1949.

41. Selye, H., Sylvester, O., Hall, C. E., and Leblond, C. P.: Hormonal production of arthritis, J.A.M.A., 124:201-207, Jan. 22, 1944.

42. Spies, T. D., and Stone, R. E.: Relief of the symptoms of acute gout and rheumatoid arthritis by means of pituitary adrenocorticotropic hormone (ACTH), South. M. J., 42: 720, Aug. 1949.

43. Sprague, R. G., Powers, M. H., Mason, H. L., Albert, A., Mathieson, D. R., Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F.: Observations on the physiologic effects of 17-hydroxy-11-dehydrocorticosterone (cortisone) and adrenocorticotropic hormone (ACTH) in man, Arch. Int. Med., 85:199-258, Feb. 1950.

44. Thorn, G. W.: Quoted by Robinson et al.[34]

45. Thorn, G. W., Bayles, T. B., Massell, B. F., Forsham, P. H., Hill, S. R., Smith, S., and Warren, J. E.: Studies on the relation of pituitary-adrenal function to rheumatic disease, New England J. Med., 241:529-537, Oct. 6, 1949.

46. Wolfson, W. Q.: Role of the hormones in the pathogenesis and treatment of gout, Progress in Clinical Endocrinology, edited by S. Soskin, New York, Grune & Stratton. In press.

Anuria and Oliguria

A Review of Symptoms, Pathologic Physiology and Mortality Rates

PART I

JAMES J. HOPPER, JR., M.D., and JOHN W. PARTRIDGE, M.D., *San Francisco*

THIS presentation is concerned with (1) a summary of the pathogenesis and pathological physiology of anuria and (2) an inquiry into the reported incidence of medical anuria and oliguria and an analysis of the shortcomings in reporting these statistics. A following article (Part II) will be concerned with a rational approach to the treatment of anuria and oliguria and will contain a case history which illustrates the conservative mode of treatment used at the University of California Hospital during the past few years.

TYPES OF ANURIA*

Anurias have been classified as:

1. Pre-renal or circulatory, indicating that the causative lesion interferes with the supply of blood to the kidney;
2. Renal or excretory, implying an intrinsic lesion of the kidney;
3. Post-renal or eliminatory, reflecting obstruction of the urinary tract.

Obviously anuria is only a sign, since it may signify any one of these several situations.

The authors have been concerned mainly with the pre-renal and renal anurias which they have chosen to call medical anurias. Prolonged insufficient blood supply (pre-renal) to the kidneys ultimately leads to a lesion involving the lower nephron,[137, 138] so that it can be said that pre-renal disturbances lead to renal anuria. The authors have been particularly interested in this state, which is commonly known as lower nephron nephrosis. Post-renal anuria is often amenable to surgical or instrumental treatment. Since this subject is thoroughly covered in the urological literature, it will not be discussed here.

SYMPTOMS AND SIGNS

The symptoms and signs of uremia are generally well known. However, attention will be called to a few seen particularly in acute anuria.

Hypertension may or may not develop; its presence has been most variable in the cases observed or reviewed by the authors (nine instances in 28 patients). Question arose as to whether blood pressure is especially liable to rise with overhydration. Hoffman and Marshall[53] reported elevated blood pressure in all of their patients made edematous. In the authors' experience, the blood pressure returned to normal in most instances following recovery, if it had been previously normal.

Jaundice. It is noteworthy that in 28 cases of oliguria or anuria in our files, jaundice was observed in 13 patients, of whom four had undergone prostatectomy and eight had received whole blood transfusions immediately preceding the onset of anuria.

Hemorrhagic tendency. Anuric patients, like other patients with uremia, frequently have a hemorrhagic tendency manifested by petechiae, ecchymoses and gastrointestinal bleeding. Prothrombin concentration, bleeding and clotting time, and plasma vitamin C are not usually abnormal. The explanation of this tendency is not clear, and at present any therapy directed against it must be purely empirical.

Pain. Generalized muscle tenderness and severe muscle pain are occasionally found a few days after the onset of anuria. Patients also may develop muscular hyperirritability and hyper-reflexia. One of the authors (J. H.) has observed five patients in whom the mere touching of the muscles of the extremities elicited pain responses. Some patients experienced pain whenever they moved, and even the weight of the bed-clothes caused distress. Occasionally this "anuric type" of pain, with the muscle guarding which it involves, masquerades as "acute abdominal catastrophe" which may be a source of confusion to the surgeon. These phenomena lack adequate explanation. They are probably not due to vitamin deficiency, since they occur in well-nourished individuals and in the presence of massive vitamin therapy. They perhaps relate to accumulation of acid end-products.

Convulsions will be discussed under treatment in Part II.

PATHOLOGIC-PHYSIOLOGICAL CHANGES IN ANURIA

The physiological changes induced by anuria are similar to those occurring in complete nephrectomy. There is loss of the ability to eliminate non-protein nitrogen wastes and loss of control over electrolyte and water balance (osmotic pressure relationships). The adjustment of acid-base balance, normally shared by kidneys and lungs, must be accomplished solely through the pulmonary control of carbon dioxide.

From the Division of Medicine, University of California School of Medicine, San Francisco.

*Anuria literally means "no urine formation." Lattimer,[67] however, has arbitrarily defined anuria as a state in which the kidneys form 100 cc. or less of urine daily. The authors have used the term loosely and somewhat interchangeably with the word oliguria. In view of the probability that the underlying lesion is identical in both, this usage seems justifiable.

These changes are complicated by secondary effects: With the accumulation of acid metabolites, nausea and vomiting often occur, inducing electrolyte loss and also resulting in starvation. It will be recalled that, in starvation, glycogen stores are rapidly depleted and metabolic or energy needs must then be met by the catabolism of fat and protein. Protein catabolism, while furnishing glucose for essential needs (to the nervous system), releases nitrogenous end-products (mainly urea), potassium, and acids, such as sulfates and phosphates, which may reach toxic concentrations in the blood when not regulated by the kidneys. Fat catabolism, while supplying needed calories, leads to the formation of acetoacetic and betahydroxybutyric acids, thereby throwing an additional burden on the remaining mechanism for the adjustment of acid-base relationships.

Electrolytes. Since maintenance of electrolyte balance of the body fluids is largely under renal control, it is important to understand the alterations which loss of this control imposes.

It is convenient to divide electrolytes into two groups: (1) those serving osmotic pressure functions and (2) those with special physiological functions. A glance at Figure 1 will reveal that the main electrolytic cation of extracellular fluid is sodium. Because of its abundance in extracellular fluid, its small molecular weight* and its pharmacologic inertness,[42] sodium is able to serve as the most important cation in the maintenance of osmotic pressure. This role necessarily relates sodium closely to body water, so that, in the presence of normal renal function, sodium and water move together in the extracellular fluid and a constant relationship of sodium concentration to water is maintained.[28]

The other cations depicted in Figure 1 are present in little more than trace concentrations as compared to sodium. They are found in insufficient amounts to contribute more than a small share to osmotic pressure needs. On the other hand, through their pharmacodynamic action they exert a powerful influence on certain physiological functions. These functions have been frequently summarized and can be profitably reviewed.†

Since potassium accumulation in anuria can prove fatal,[112] only this pharmacodynamically active substance will be considered here. Potassium is abundant within cells, where it serves as the main intracellular base just as sodium serves extracellular fluid, and in a similar manner subserves osmotic pressure needs within cells. The potassium concentration of extracellular fluid is usually maintained at 3.8 to 5 meq. per liter of plasma. The normal kidneys excrete it rapidly when it is present in higher concentrations. Serum levels as high as 12 meq. per liter have been survived;[45] however, it seems improbable that this is frequent, as cardiac arrest in diastole is likely to occur even at lower concentrations.[127] Cellular catabolism accelerated by the starvation of vomiting produces an obligatory release of potassium into the extracellular fluids. Although this mechanism appears to be a realistic consideration in animals with anuria,[9, 32, 95, 143] it is apparently seen less often in man. The authors have observed only one patient in whom elevated serum potassium may have caused death. A possible explanation is that the treatment used has been focused on minimizing catabolic processes, thereby blocking potassium release from cells. Another explanation probably lies in the fact that the patients treated by the authors have not had crush syndrome. Strauss[128] recently mentioned an instance of potassium intoxication in lower nephron nephrosis.

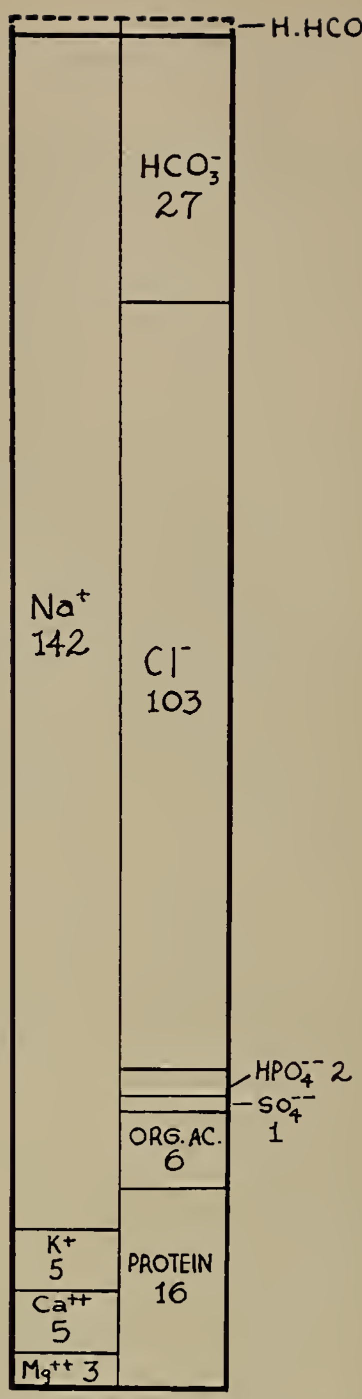


Figure 1 (adapted from Gamble).—The normal electrolyte composition of blood plasma (expressed as milliequivalents per liter of plasma).

In view of the potential toxicity of potassium accumulation, it is desirable to determine the serum potassium content in anuric patients at regular intervals. If this is not possible, serial electrocardiograms should be used for detecting changes related to potassium accumulation. These changes consist of (1) diminution in amplitude of the P wave, (2) widening and elevation of the T wave, and (3) S-T depression.[52, 144, 145] Serum potassium diminution is characterized by low amplitude or inversion of the T waves.

---

* Osmotic pressure is directly proportional to the number of molecules per unit volume of fluid.

† See references 10, 15, 42, 55, 79, 84, 89, 106, 108, 123, 125, 142, 144, 145.

PATHOLOGY

There are several theories as to the basic physiological mechanisms which cause the anurias of transfusion reaction, crush syndrome, shock, burns, blackwater fever, and intravascular hemolysis.*

Most investigators[43, 78, 133, 135] now agree that the renal lesion is quite similar in anurias of the following states: Incompatible blood transfusion, intravascular hemolysis, crush syndrome, alkalosis, septic abortion, concealed accidental hemorrhage, cholera, yellow fever, sulfonamide toxicity; mercury, arsenic, bismuth and carbon tetrachloride poisoning; burns, shock, and blackwater fever. The typical picture is one of cortical ischemia and medullary vascular congestion. The tubular epithelium of the ascending loop of Henle and of the distal convoluted tubule shows degeneration and disintegration. The lumina are full of debris and the cells are flattened. The glomeruli remain nearly normal. The heavy metals tend to involve the proximal tubule more than the distal tubule.

Trueta and co-workers[135] in their recent work on renal blood flow reawakened interest in the mechanisms involved in renal shutdown. They were able to demonstrate in animals (rats and rabbits) a juxtamedullary vascular shunt which can cause the arterial blood supply to by-pass the cortex completely. This vascular shunt could be induced in one kidney by faradic stimulation of the proximal end of the cut sciatic nerve of the same side and by stimulation of the renal sympathetic plexus. Intravenous injection of pilocarpine nitrate, neostigmine, epinephrine hydrochloride, ephedrine hydrochloride, and the posterior pituitary hormones, Pituitrin® and Pitressin,® also produced the same shunting mechanism. In shock, this mechanism probably acts to protect the central nervous system from anoxia by insuring its blood flow despite a diminished circulatory volume; but prolonged operation of the shunt might cause renal ischemia and tubular degeneration. Van Slyke[138] found that complete renal anoxia of more than four hours' duration caused anuria in dogs.

The theory of tubular obstruction by abnormal pigments or detritus within the tubular lumen appears to be untenable since complete obstruction of *all* the tubules is never seen at autopsy, and since normal specific gravity and electrolyte content of the urine, expected if only some tubules were obstructed, is not seen in oliguria. On the basis of pathological lesions found in the tubules, Lucke[75] and Van Slyke[138] suggested that anuria is caused not by the failure of glomerular filtration but by the complete reabsorption of filtrate by damaged tubules.

REVIEW OF LITERATURE ON MORBIDITY AND MORTALITY OF ANURIA

In an effort to determine the fatality rate of nonobstructive or medical anurias, which is given variously as from 40 to 90 per cent, the authors have made a search of the literature from January 1943 to June 1947.

The most common causes of anuria were: (1) Intravascular hemolysis (20 cases with nine deaths—mortality, 45 per cent); (2) postoperative, postabortion, and postpartum renal damage (10 cases with two deaths—mortality, 20 per cent); (3) mercury poisoning (11 cases with eight deaths—mortality, 72.7 per cent); (4) shock (13 cases with nine deaths—mortality, 69.2 per cent); (5) sulfonamide toxicity or allergic reaction (16 cases with five deaths—mortality, 31.2 per cent).

The review* has been divided into two parts: (1) medical anuria, including cases attributable to sulfonamide toxicity when it was definitely stated by the authors that no sulfonamide crystals were seen in the urine or in the tubules at autopsy; (2) sulfonamide anuria due to crystalluria. Although inclined to believe that all sulfonamide anurias are the same, whether crystals are present or not, the authors have segregated anurias said to be due to sulfa toxicity from those said to be due to crystalluria because this has been done in the literature.

For several reasons, completely satisfactory conclusions could not be drawn from the statistics gathered. First, no one treatment has been accepted generally. As a result, patients with anuria are treated in such various and haphazard ways that recovery rates appear to depend more upon chance than upon the effect of therapy. Clearly, in such circumstances it is difficult to decide what the recovery rate should be. Secondly, in most hospitals there is a tendency to file under the diagnosis of anuria only the histories of patients who actually die with anuria; the histories of recovered patients are filed instead under the admission diagnosis or major diagnosis. For example, the University of California Hospital files show only 12 instances of anuria between January 1937 and June 1948, in a total of 80,956 hospital admissions; whereas one of the authors (J. H.) has in his private files the records of 17 patients with anuria observed in a period of only five years at the University of California Hospital. Armstrong, Freese and Hultgren[4] reported eight cases at Stanford University Hospital between 1935 and 1945, also a suspiciously low figure.

In Tables 1 and 2, "day of diuresis" and "day of death" are defined as the number of days after the onset of anuria that these events occurred. The day upon which the patient had urine output of 1,000 cc. or more, with increments thereafter, was designated the day of diuresis. Many papers reviewed did not mention specific days of diuresis or death; therefore, these figures were omitted in compiling the

---

* See references 3, 22, 23, 38, 43, 51, 67, 74, 75, 77, 78, 99, 101, 133-138.

* A few foreign journal references for these years which were not available in this country are not included in these statistics.

Cause of Anuria	No. of Cases	No. Recvrd.	Ave. Day Diuresis	Range	% Recvrd.	No. Died	Ave. Day Death	Range	% Died
Intravascular Hemolysis	20	11	10.1 [7]	4-12	55	9	11.3 [7]	6-17	45
Post Partum, Post Operative, Post Abortion	10	8	12.5 [6]	7-16	80	2	7 [2]	2-12	20
Black water Fever	1	1	11 [1]	—	100	0	—	—	—
Mercury Poisoning	11	3	9 [2]	8-10	27.3	8	18.8 [6]	4-24	72.7
Bismuth Toxicity	3	1	?	—	33.3	2	7.5 [2]	5-10	66.7
Crush Syndrome	5	3	3 [1]	—	60	2	9.5 [2]	7-12	40
Shock	13	4	2.3 [4]	2-3	30.8	9	7.8 [9]	3-17	69.2
Burns with Toxic Nephritis	2	0	0	—	0	2	5 [2]	2-8	100
Arsenical Poisoning	2	2	11.5 [2]	7-16	100	0	—	—	—
Carbon Tetrachloride Poisoning	2	1	10 [1]	—	50	1	10 [1]	10	50
Reflex Anuria	8	7	3.2 [8]	1-8	87.5	1	15 [1]	15	12.5
Hepato-Renal Syndrome	2	0	0	—	0	2	6 [2]	4-8	100
Diagnosis Miscellaneous	6	6	7.5 [6]	3-12	100	0	—	—	—
Sulfonamide Allergy or Toxicity	16	11	5.4 [7]	2-14	68.8	5	10 [5]	3-21	31.2
Total	101	58	7.3 [45]	2-16	57.4	43	10.4 [39]	2-24	42.6
Sulfonamide Crystal Anuria	84	82	3.1 [35]	1-11	97.6	2	3.5 [2]	3-4	2.4

Table 1.—Mortality according to cause of anuria. The 101 cases in the literature are segregated by causes of anuria. "Sulfonamide crystal anuria" is inserted below for comparison. The figures in brackets represent the number of cases from which each average is obtained. See text for full explanation.

Treatment	No. of Cases	No. Recvrd.	Ave. Day Diuresis	Range	% Recvrd.	No. Died	Ave. Day Death	Range	% Died
Renal Decapsulation	15	11	11.9 [6]	10-16	73.3	4	13.2 [4]	4-24	26.7
Forced Fluids	49	18	5.1 [15]	1-12	36.7	31	10 [31]	3-21	63.3
Fluid Restriction, Electrolyte Adjustment	17	14	9.9 [12]	3-14	83.3	3	7 [1]	7	16.7
Intravenous Procaine	3	3	6 [3]	3-9	100	0	0	0	0
Spinal Anesthesia	1	1	11 [1]	11	100	0	0	0	0
Splanchnic Block	4	2	6 [2]	6	50	2	11 [2]	10-12	50
Adrenal Cortical Ext.	3	2	2 [2]	2	67	1	4 [1]	4	33
Transfusions and Fluids to Combat Shock	12	1	2 [1]	2	8.3	11	7.5 [11]	3-15	91.7
Sodium Sulfate	5	3	3 [1]	3	60	2	13.5 [2]	6-21	40
Peritoneal Lavage	10	5	11.7 [3]	10-14	50	5	14.7 [3]	8-26	50
Ureteral Catheterization	3	2	2 [2]	2	67	1	7 [1]	7	33
Miscellaneous	7	4	8.3 [4]	1-16	57.1	3	17 [3]	7-26	42.9

Table 2.—Mortality according to type of treatment used in 101 cases reviewed from recent literature. Figures in brackets represent number of cases from which averages were computed. (See text) Total number of cases exceeds 101 since several patients received more than one type of therapy and accordingly are duplicated under the "Number of Cases" column.

averages. The numbers in brackets in Tables 1 and 2 indicate the number of cases in which a specific day was given for these events. Example: Table 1, intravascular hemolysis: Patients recovered, 11; average day of diuresis, 10.1(7). The average was figured on the basis of only seven cases, because data on the remaining four cases were insufficient.

In the 101 cases of medical anuria reviewed (Table 1), 58 patients recovered and 43 died, a mortality of 42.6 per cent. The average day of diuresis was 7.3; the average day of death was 10.4.

The most commonly used therapy (Table 2) was that of forced fluids (orally, rectally, or parenterally). Of the 49 patients so treated 31 died, a mortality of 63.3 per cent. With another form of the same treatment, transfusions and fluids to combat shock, 11 of 12 patients died, a mortality of 91.7 per cent. In the latter instance, an average day of death of 7.5 indicates that the patients were not dying from the shock itself. The lowest mortality rate occurred in the group of patients whose fluid intake was restricted and in whom an attempt was made to maintain electrolyte balance (17 cases with 14 recoveries—mortality, 17.6 per cent).

Study of the treatment used on the 43 patients who subsequently died is instructive. Thirty were treated by forced fluids, alone or in combination with some other therapy; five by peritoneal dialysis; two by the use of artificial kidney; two by means of renal decapsulation (one by forced fluids and renal decapsulation together); one each by reciprocal blood transfusions, restriction of fluids, transfusion and fluids to combat shock; and one by treatment not specified. In many instances autopsies were not done. When they were done, few of the necropsy findings were included in the case reports. A striking fact is that overhydration, observed either clinically or at autopsy, was commonly found. The authors considered one or more of the following as evidence of overhydration: Peripheral edema, pulmonary edema, pleural or pericardial effusions, and ascites.

In 21 of the 43 cases in which death occurred, there was definite mention of excessive hydration at the time of death. In 14 cases, there was no mention of any particular clinical or necropsy findings at death. In eight of these 14 cases, fluids had been forced. By relating fluid intake in these patients to known values for extracellular fluid volume, it was obvious that overhydration was probable but was overlooked as unimportant and was not mentioned by the authors. There were three deaths due to bowel perforation and peritonitis from mercury poisoning; two in which renal damage alone was mentioned; three unavoidable deaths not due to uremia; and one each from intracranial hemorrhage, multiple pulmonary infarcts, and mercury gostroenteritis with nephritis and bronchopneumonia.

Lattimer[67] mentioned a patient anuric 37 days and oliguric 13 days who was kept alive by skillful management of electrolyte balance and fluid administration. He described another patient who died after 21 days in anuria. More recently, Strauss[128] mentioned similar instances.

Burwell, Kinney, and Finch,[17] in a recent review of the literature, found 34 cases of anuria due to intravascular hemolysis in which the day of diuresis ranged from 1 to 16. The authors' review (Table 1) and experience indicate an identical range. Lattimer[67] and Strauss[128] cited several cases in which patients recovered after longer periods of anuria; Strauss pointed out that in the days before intravenous fluid therapy it was not unusual for a patient to live 25 days or longer in complete anuria. The authors believe that in uncomplicated anuria death before the tenth to the sixteenth day implies inadequate treatment. Only six of the 43 deaths noted in a review of the literature occurred after the 16th day of anuria. In addition, there were five unavoidable deaths—one due to pulmonary infarction, one to cerebral hemorrhage, and three to bowel perforation from mercury gastroenteritis. As there were 11 unavoidable deaths in 101 cases reviewed, theoretically the mortality rate could have been 10.9 per cent. The actual mortality rate was 42.6 per cent.

It is of interest to note that in the anuria accompanied by sulfonamide crystalluria, the mortality is only 2.4 per cent in a series of 84 cases. The two patients who did not recover were treated by forcing fluids and died in pulmonary edema within four days after the onset of anuria, clearly toon soon for the ill effects of uremia. Although cystoscopy and ureteral catheterization with lavage are extensively used for individuals with sulfa anuria, spontaneous recovery occurred within four days in most patients who were treated conservatively, and in only one of the 84 cases was diuresis delayed until the eighth day.

The urological service at the University of California Hospital has adopted a conservative approach to the treatment of anuria and rarely performs cystoscopies or ureteral catheterizations because of sulfa crystalluria. There have been no deaths accompanying sulfa crystalluria in the University of California Hospital.

In summary, Tables 1 and 2 indicate a mortality from anuria of 42.6 per cent. In the authors' opinion the percentage is this high because it excludes the statistics on recovered patients. Further, an analysis of the statistics on the patients who died shows that, with the exception of deaths from mercury poisoning, the high mortality rates relate as much to the treatment as to the cause of the anuria. The lowest mortality, 13.6 per cent, was in the group of patients for whom fluid intake was restricted and in whom an attempt was made to maintain electrolyte balance. Mortality was highest in groups in which fluids were forced.

TYPES OF TREATMENT

The treatment with blood and blood substitutes of pre-renal failure due to shock is well known and will not be discussed here. Since shock tends to be progressive once it is established, it is unlikely that it can act as more than a temporary or initiating factor in anuria. As mentioned previously, recent developments in the therapy of maintained anuria or oliguria have been formulated in the belief that such anuria or oliguria is caused by a lesion of the lower nephron. Accordingly, therapy has been aimed at maintaining life long enough to permit tubular regeneration. Various treatments have been designed to gain this time. Repair processes begin promptly after the removal of the responsible agent and are usually complete enough by the eighth to 14th day for the kidneys to resume partial function, thereby bringing about urine output. Clearly, renal decapsulation, intravenous administration of procaine, spinal anesthesia, splanchnic block, caudal block and the like are treatments predating the concept of the lower nephron lesion as a cause of anuria.

Renal decapsulation. There are two current theories as to how renal decapsulation works: (1) it releases intrarenal pressure, thus allowing nephrons to function again; (2) it destroys the sympathetic control of the renal vascular system and permits vasodilatation which leads to resumption of the normal function of the nephrons. Hinman,[52] reviewing 156 patients with mercury poison anuria who were treated by decapsulation, reported recovery in 14; Brenner[14] reported 59 patients given similar treatment, with 14 recoveries. This amounts to a total of 215 cases with 28 recoveries or a mortality of 87 per cent, which is slightly higher than the 72.7 per cent mortality in the 11 patients with mercury poisoning who were treated in the various ways shown in Table 1.

Peters[111-113] recommended decapsulation to relieve increased intrarenal pressure within the first 24 hours in the case of anuria due to crush injury and transfusion reaction. He omitted data, however, concerning the subsequent onset of diuresis, which is essential for judging the efficacy of decapsulation. If the intrarenal pressure theory is correct, diuresis would be expected to occur immediately after operation.

Table 2 lists 15 cases of acute medical anuria (all types) in which the patients were treated by unilateral or bilateral renal decapsulation. The average day of diuresis was 11.9. The average day of operation was after 5.4 days of anuria, with a range of three to 11 days. There was not a single case in which diuresis occurred before the third postoperative day. In all instances the course of the anuria bore no immediate relationship to the decapsulation, and the onset of diuresis fits into the sequence of events seen in the natural course of anuria in which decapsulation has not been done.[132]

Van Houtum and Covarrubias[136] have expressed the feeling that decapsulation has a definite place as a treatment for the relief of anuria caused by acute glomerulonephritis. They postulated that destruction of the renal sympathetic nerves induces diuresis. As examples, they cited two cases in which the relief of anuria of five and six days' duration occurred immediately after operation. A case reported by Hoffman and Marshall[53] vividly illustrates the difficulty of evaluating the effects of decapsulation.

Intravenous administration of procaine. Procaine given intravenously as a treatment for anuria has been recommended by European workers. Theoretically, it anesthetizes the renal sympathetic nerves, which permits vasodilatation. Masselot[85] reported that one patient given procaine intravenously on the seventh day of anuria voided 700 cc. of urine during the next 24 hours. Langeron, Paget, and Michaux[66] reported a case of sulfonamide anaphylaxis with anuria completely relieved 24 hours after the intravenous administration of three 100 mg. doses of procaine at two-hour intervals; diuresis occurred on the third day of anuria. Loeper and Sterboul[72] reported that a patient given 150 mg. of procaine intravenously on the second day of anuria did not have diuresis until the seventh day. Although it is possible that intravenous administration of procaine may be of some benefit, there is insufficient evidence to suggest that the anuria would not have been relieved without it.

Spinal anesthesia,[81, 116] *splanchnic block,** and *caudal block anesthesia*[128] have all been used with the idea of producing renal vasodilation, despite the fact that anuria is sometimes a sequel to such procedures.

Vividialysis in its several forms—(1) peritoneal dialysis, (2) small and large bowel perfusion, gastric lavage, and (3) dialysis of the patient's blood with a mechanical kidney—has been employed extensively with varying success in attempts to remove metabolic waste products from patients in renal failure.

1. *Peritoneal dialysis* has been used by Pearson,[103] Frank, Seligman and Fine,[39] Abbott and Shea,[1] and many others[92] within the past four years. The notable defect of this technique is the frequency of infection despite the use of antibiotics. Although nitrogenous end-products can be removed by this technique, its many difficulties outweigh its practicability.

2. *Small and large bowel perfusion* has been used in both animals and man by many investigators.[96, 100, 104, 117, 141] Continuous lavage of the colon has been employed by Daugherty, Odell, and Ferris.[29] Numerous demonstrations have shown that nitrogenous end-products can be removed effectively if a sufficient length of small bowel is perfused with sufficient fluid. This technique, like that of transperitoneal perfusion, is beset with difficulties. Notable among these is that of controlling water accumulation and that of preventing the development of paralytic ileus. The large bowel has proved a relatively ineffective route for removing nitrogenous end-products. Its use as a dialysing membrane is complicated by its particular ability to absorb fluid and electrolytes. The available surface in the stomach is inadequate and the exchange is limited.

---

* See references 20, 47, 72, 114, 122.

3. *Mechanical kidneys*[2, 60, 61, 94] which make use of dialysis ordinarily require a long semipermeable cellophane tubing, through which the subject's blood is passed. Dialysis of unwanted materials is made across the membrane into a surrounding heated fluid bath. This technique requires the use of anticoagulants and of the necessary blood assays to prevent hemorrhage. Usually the artificial kidney requires so much blood that it must be primed with compatible donor blood. Care and control of the equipment are complicated and demand competent technical help and elaborate laboratory facilities. As yet, the results obtained with mechanical kidneys have not shown this method to be superior to more conservative measures.

Reciprocal blood transfusions,[121, 124] although little used, are of great interest and undoubtedly have been insufficiently explored in the treatment of anuria.

Resin exchange mechanisms[8, 64, 91] are of interest in that exchange resins may be administered enterally. Since it is not known what components of the blood should be removed in order to maintain life in the absence of renal function, methods more closely imitating renal mechanisms (viz., dialysis) may be more desirable. Resin exchange kidneys, however, merit careful and extended study.

Testosterone[49, 86] through its protein anabolic action is said to exert a favorable influence in the presence of renal failure. The efficacy of this measure in relieving the toxemia of uremia or in prolonging life has not been convincingly demonstrated. In any circumstances it cannot be considered as more than an adjunct to other measures.

Water overloading. Although frequently done inadvertently, water overloading has not been advocated until recently as a mode of treatment in anuria. Hoffman and Marshall,[53] while recognizing its danger, suggested that in patients with competent circulatory systems, the end-products of catabolism can be rendered less toxic by dilution in induced edematous fluid. The treatment, which will be discussed in Part II of this article, is based upon the assumption that the danger of heart failure and pulmonary edema outweighs the beneficial effects of dilution, and that accumulation of toxic products can be delayed sufficiently by other means.

Diuretics will be discussed in Part II.

This is Part I of an article in two parts. Part II, with a list of references for both parts, will appear in a succeeding issue.

The Use of the Male California Toad in the Diagnosis of Pregnancy

DONALD A. JOHNSON, B.S., M.S., *Tulare*

SUMMARY

The California male toad, readily available in most areas of the state, and for many other reasons a better subject for test purposes than the frog, was used in 237 tests to determine the presence or absence of pregnancy in humans. Human urine was injected into the toads, and the cloacal discharge then was examined for the presence of sperm. There were only two false reactions in the series—both false negative. In subsequent tests in both these cases, the result was positive.

AMONG the forerunners of present-day frog tests for pregnancy was the technique described by Shapiro and Zwarenstein in which they utilized the female South African clawed frog (Xenopus laevis). Bellerby,[1] in 1934, also reported favorably on the accuracy and simplicity of this test.

Galli-Mainini,[2] in 1947, demonstrated that the male South American toad (Bufo arenarum Hensel) emitted spermatozoa after stimulation with mammalian chorionic gonadotropin. Previously, Robbins and Parker[3] had demonstrated this reaction in the male frog.

That the common North American male frog (Rana pipiens) is an excellent and easily available test animal for the diagnosis of pregnancy has been pointedly emphasized in the work of Wiltberger and Miller[4] (1948) and Robbins and Parker[3] (1948).

The basic physiology of the Aschheim-Zondek, Friedman, rat hyperemia and frog tests consists of animal assay methods of detecting increased levels of pregnancy hormones.

In the opinion of numerous competent workers, frog tests are not only simpler, more rapid, and more economical but are apparently more sensitive in the diagnosis of early pregnancy.

In positive reactions the female frog responds by the extrusion of grossly visible ova; the male frog by the ejaculation of spermatozoa which are readily distinguishable by the microscopic examination of fluid from the external cloacal orifice.

The accuracy and speed of the male Rana pipiens test has been duplicated by the author of this article in a technique utilizing the male California toad (Bufo boreas halophilus).

The reason for the choice of this toad was its wide distribution throughout California except in deserts and highest mountains. Easier to obtain and handle, the toad presents no problems in feeding, maintenance and (important) differentiation of sex. It is the male that does the vocalizing: A sweet falsetto trill, birdlike in character, reminding the listener of the prairie chicken, or quail. Handle the male toad, stroke it or shake it, and it will usually set up an audible protest. The female California toad is inarticulate, somewhat larger and more heavily built. During the regular breeding season (January to May) the skin of the female remains rough, whereas that of the male becomes smooth. The males usually have areas of rough, dark-colored skin on the "thumb" and inner sides of two adjacent "fingers."

Toads readily adjust themselves to artificial living conditions. For practical purposes all that is required is a box containing gravel and garden soil (light and loose for burrowing purposes) with a tray or pan filled with water at one end. The top of the box is covered with chicken wire and an electric light bulb is suspended over it in order to attract flying insects at night. This arrangement may be modified by laying the box on its side, thereby providing a wooden "ceiling" which may be hinged to facilitate handling.

Being cold-blooded vertebrates, toads, like frogs, may be induced into a state of artificial hibernation by storage in the laboratory refrigerator at temperatures not lower than 4° C. Under these conditions metabolic activity is so little that the various vital functions are carried on at the lowest possible levels and the animals are kept "fresh" for long periods. Undoubtedly, also, the ample reserve food supply of the toad (stored in fat, muscle, liver and elsewhere) is used up partly for fuel to keep the spark of life smouldering and partly for elaborating the sexual products.

The California toad, and toads in general (of the genus Bufo), may be distinguished from other tailless amphibians by the presence of a large raised area, the parotid gland, on each "shoulder" behind the ear membrane. The age of the adult California toad is two to three years. Other physical characteristics are: Dry skin with numerous large "warts"; upper surface grayish-green, with many large, irregular spots or streaks of black; a conspicuous streak of white extending along and down the middle of head and back; undersurface dull yellow, sometimes with numerous small black spots; hind legs only twice as long as forelegs; jaws without teeth; head-and-body length (snout to vent) ranging from 3½ to 4½ inches.

Bufo boreas halophilus is such a heavy-bodied animal that it seldom hops in the conventional manner. When not frightened it walks in slow fashion, dragging the hind feet so that the toes are continually in contact with the ground. It breeds in ponds and quiet water of streams, irrigation ditches and "reservoirs" on farming land. Its non-breeding habitat is on or a little below the surface of the ground, wherever shelter can be found—often in gardens, parks and golf courses. It feeds on all kinds of insects and worms. It is easier to capture that the slippery, agile frog. Sufficient numbers may be obtained by advertising in local newspapers. Other good sources of supply are frog farms in the larger cities and biology classes at local schools.

Toads are carnivorous. Their favorite food consists of insects, worms, small fishes and the young of their own or allied species. Earthworms seem to be especially relished. Canned turtle food, fish food and even morsels of meat such as hamburger may be dropped directly into their buccal cavity by prying open their jaws. Toads usually retain and swallow much food whereas the frog is more liable to regurgitate it. Twice-weekly forcible feedings undoubtedly are of some value in restoring vitality to recently used animals.

Upon dissection, both male and female reproductive systems of the toad are found to be rather intimately associated with the excretory system. The male system consists of a pair of yellow oval testes, lying against the dorsal wall in contact with the kidneys. The testes have no ducts of their own, but send forth their products through the ducts of the kidneys. Attached to the anterior part of the testis is a fat-body, composed of orange-colored finger-like masses. These become very large in the summer and act as reserves of food in later months.

The female reproductive system consists of two large egg masses or ovaries. Beside each ovary is its long, large white coiled oviduct.

Toads may be killed for dissection by subcutaneous injection of chloral hydrate solution (a few crystals dissolved in 3 cc. of water) or by plunging a sharp instrument into the brain at the base of the skull.

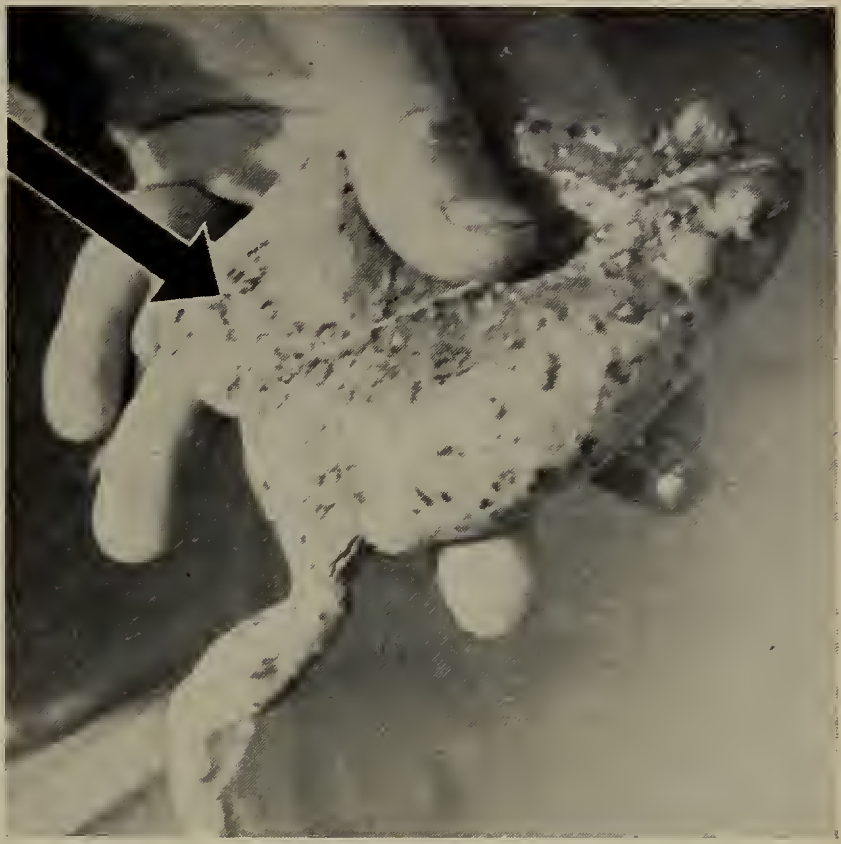
By the use of the male California toad, as with the Rana pipiens, laboratory diagnosis of pregnancy can be carried out within two to three hours, often sooner. The endpoint is unequivocal; sperm is either present or absent.

TECHNIQUE

The following technique is based on analyses on 237 specimens of urine from the sources shown in Table 1. Accuracy of 99 per cent was attained.

Technique.

Collect the first morning specimen of urine, which is a concentrated one, in a clean container, not necessarily sterile. Random specimens with a not too dilute specific gravity have proven satisfactory. Centrifuge, filter or let stand to clarify. Without adjustment of pH or control of temperature, inject 5 to 10 cc. subcutaneously into the dorsal lymph sac of each of a pair of male toads. Thrust the needle (22 gauge) superficially into the upper thigh muscle area, directing the point to the midline just above the upper cloacal fold near the acetabulum.



The male California toad (Bufo boreas halophilus). Recommended method of injecting urine into subcutaneous dorsal lymph sac. Needle (arrow) is directed toward median line just above the upper cloacal fold.

Beginning one hour later obtain fluid, using a glass pipette, from the external cloacal orifice and examine under the low power lens of the microscope with reduced light. Spermatozoa, usually actively motile, are very readily seen if present. This is a positive reaction. The long, undulating flagellum of the individual sperm is easily distinguishable when the high power lens is used.

A negative reaction is reported when no sperm is seen during a three-hour period of observation following inoculation with the test urine. In certain cases in which the reaction is negative, urine from a woman known to be pregnant is administered in order to demonstrate the ability of the toads used to respond to the presence of the chorionic hormone.

Occasionally the urine proves to be toxic, either killing the toad or rendering it very ill. If another specimen cannot be conveniently obtained, the split-dosage technique of Robbins and Parker may be employed: Two half-doses given an hour apart.

TABLE 1.—*Results of Toad Tests for Frequency*

Source of urine	Correct Positive	Correct Negative	False Positive	False Negative
Pregnant women	136	....	....	2
Women with amenorrhea without pregnancy	....	63	0	....
Normal women with menses	....	36	0	....
	136	99	0	2

Before giving the second injection it is advisable to make an examination of cloacal fluid, as a positive reaction may already be discernible at this stage.

NOTES

After a resting and feeding period of at least three weeks in a separate terrarium, animals which have been shown to react positively may be reused.

The toxicity of certain urines is most often due to drugs (ergot, quinine, morphine, codeine, sulfa drugs and even acetylsalicylic acid). The patient should abstain from taking drugs prior to collection of the specimen.

Blood serum and urine may be used interchangeably. It is claimed that, in the interests of a less toxic, more constant source of hormone, blood serum appears to be preferable. However, many laboratory technicians favor the use of urine over serum.

If a negative report is obtained on a specimen voided less than seven days after the first missed menstrual period, the test should be repeated later.

As the initial step in the Bufo test the author deems it wise to examine a cloacal smear prior to inoculation to rule out the spontaneous presence of sperm.

CONCENTRATION METHOD

A rapid concentration method may be used upon encountering certain urines suspected to contain a low hormone titer: Adjust entire collection of urine to a pH less than 4.5 by adding hydrochloric acid drop by drop until nitrazene paper turns sharply lemon yellow and blue litmus turns sharply red. Place all of specimen in a 1000-cc. graduated cylinder and mix with 2 volumes of acetone. Let stand or centrifuge to collect sediment. Pool sediment in centrifuge tube and wash with ether, mashing and spreading sediment along sides of tube with an applicator stick. Decant ether (or centrifuge) and run current of air over sediment until dry. Dissolve sediment with 3 to 4 cc. of water, using same applicator stick (which has remained in tube) to disperse and break up clumps. Centrifuge and adjust supernatant to pH 5.5 or pH 6.00 with sulfosalicylic acid. Inject half-portions of this into each of a pair of male toads.

DISCUSSION

Duplicate tests utilizing Rana pipiens were conducted in every instance in this series of 237 tests with the California toad. Occasionally rabbits were employed to corroborate certain negative findings. No discrepancies were noted.

In this series two false negative reactions were obtained. Tests with urine specimens collected one week later, in both cases, gave positive results. In connection with the false negative reactions, various possibilities may be mentioned: (1) Low hormone titer (specimens collected too early?); (2) use of immature toads (only those definitely measuring over 3½ inches from snout to vent should be selected); (3) presence of inhibitors or depressants due to drugs, medicines, etc.; (4) urine of very low specific gravity. The following guide for determining the dose from the specific gravity is recommended:

Specific Gravity	Dose
Under 1.012	10 cc.
1.013 to 1.019	8 cc.
1.020 to 1.029	6 cc.
1.030 and over	5 cc.

P. O. Box 1201.

REFERENCES

1. Bellerby, C. W.: Rapid test for diagnosis of pregnancy, Nature, London, 133:494, March 31, 1934.

2. Galli-Mainini, C.: Pregnancy test using the male toad, J. Clin. Endocrinology, 7:653, Sept. 1947.

3. Robbins, S. L., and Parker, F., Jr.: Use of male North American frog (Rana pipiens) in diagnosis of pregnancy, Endocrinology, 42:237-243, April 1948.

4. Wiltberger, P. B., and Miller, D. F. P.: Male frog, Rana pipiens, as new test animal for early pregnancy, Science, 107:198, Feb. 20, 1948.

Chloramphenicol in the Treatment of Typhoid Fever

LEON ROSOVE, M.D., *Los Angeles*, JACK S. CHUDNOFF, M.D., *Los Angeles*,
and ALBERT G. BOWER, M.D., *Pasadena*

SUMMARY

Six patients with typhoid fever were treated with chloramphenicol. The excellent clinical response in four cases suggests that chloramphenicol is the drug of choice in the treatment of this disease. In one case in which clinical relapse occurred, there was good response to re-treatment. One patient, critically ill, in a typhoid state, and treated late in the course of the disease, died without beneficial effect from chloramphenicol, but the patient had been unable to retain the drug because of vomiting.

THE new antibiotic chloramphenicol has been demonstrated to be effective in the treatment of typhoid fever. E. typhosa has been shown to be sensitive in vitro to less than one microgram per milliliter of chloramphenicol.[2, 6] It is well absorbed from the gastrointestinal tract, is only given orally and is effective by that route. Toxicity has proven to be low both experimentally in animals and in the treatment of human infections.[3, 6] Treatment of typhoid fever with chloramphenicol was first favorably reported by Woodward and his collaborators[8] from the Institute for Medical Research, Kuala Lumpur, Malaya. Ten patients were treated with prompt response in all, blood cultures becoming negative and fever subsiding in the average time of three and one-half days. There were two instances of relapse after afebrile periods of ten and 16 days, but in both cases the patients responded to a second course of therapy and no increased resistance to the antibiotic was shown. The total dosage of chloramphenicol per patient averaged 19.1 gm. given over periods averaging 8.1 days. The dosage schedule was 50 mg. per kilogram of body weight as an initial dose, followed by 0.25 gm. every two hours until the temperature was normal, and then every three to four hours for five days. Woodward[9] more recently reported on 21 additional patients with typhoid fever treated with chloramphenicol with uniformly favorable results. There were four relapses, two instances of intestinal hemorrhage, and one case of perforation complicated by peritonitis. One patient died during convalescence with a massive pulmonary embolus. Recent reports by McDermott and co-workers[4] and Stiller[7] on the use of chloramphenicol in typhoid fever indicate that it is efficacious in the treatment of this disease. At present, due to the previous scarcity of this antibiotic, few published reports on the treatment of typhoid fever with chloramphenicol are available. The following is a report of six cases of typhoid fever treated with chloramphenicol.

CASE REPORTS

CASE 1: An 11-year-old Mexican girl, living in Los Angeles County, was admitted to the contagious disease unit of the Los Angeles County General Hospital on March 20, 1949. The illness began March 12 with dry cough, fever and shaking chills. Fever was elevated to 104° F. in the late afternoon and shaking chills recurred the night before admission to the hospital. Diarrhea accompanied by vomiting occurred during the first week of illness and lasted three days. The patient complained of slight sore throat and vague generalized abdominal pain for several days before hospitalization. There was no history of rash or bloody stools. A physician had treated the patient with four injections of penicillin and oral sulfonamides. Two brothers had had typhoid fever three years before and were in contact with the patient.

The patient was acutely ill, but oriented and rational. The temperature was 102° F., the pulse rate 96, respirations 18 per minute, the blood pressure 150 mm. of mercury systolic and 70 mm. diastolic, and the body weight 99 pounds. There was no rash. The right tympanic membrane was mildly injected and there was slight injection of the pharynx. There was a soft basal systolic murmur, grade 1. The lungs were clear. There was active intestinal peristalsis. The spleen was not palpable.

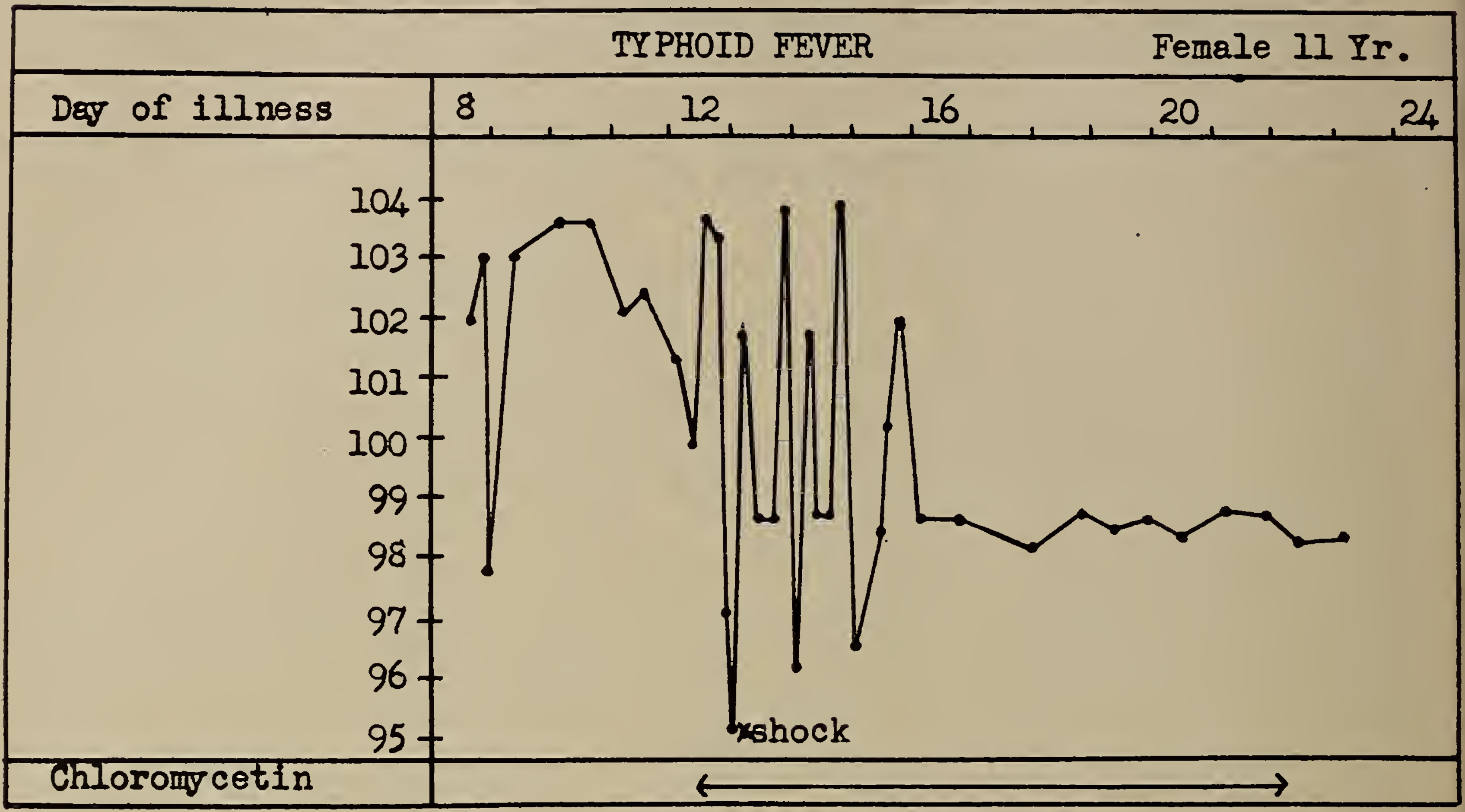
The urine was normal. Hemoglobin content of the blood was 14.5 gm. per 100 cc. Leukocytes numbered 9,400 with 70 per cent neutrophils. Subsequent counts remained constant. The CO_2 combining power was 38 volumes per cent and the non-protein nitrogen was 29 mg. per 100 cc. of blood. The prothrombin was 34 per cent of normal. X-ray films of the chest showed no abnormality. Agglutination for E. typhosa was positive in dilution of 1:320 and negative for Para A, Para B, OX-19, and Brucella. Blood cultures were positive for E. typhosa on March 20 and 23, but showed no growth on March 27 and 30. Cultures of urine taken by catheter on April 8, 14 and 19, showed no growth for E. typhosa, but the first culture contained staphylococcus albus. Three stool cultures taken on April 9, 14 and 19 showed no growth for E. typhosa.

The patient's course during the first four days of hospitalization was that of an acute infection. She became lethargic with fever to 103.6° F. A few small rose spots were noted on the abdomen and extremities. The patient was treated symptomatically until March 24, the fourth hospital day, when chloramphenicol was started. An initial dose of 2.5 gm. suspended in water was given orally, followed by 0.25 gm. every two hours until March 29, when the dose was reduced to 0.25 gm. every four hours and continued to April 2. A total of 18 gm. was given during this ten-day

---

From the University of Southern California School of Medicine and the Communicable Disease Unit of the Los Angeles County General Hospital.

CHART 1.—*Range of Temperature (Case 1) from Day of Hospitalization*



period. Administration of chloramphenicol was started on the 12th day of illness and the patient became afebrile 67 hours later. Seven and one-half hours after the first dose of the antibiotic the patient went into shock, became cold and clammy, with profuse perspiration, drop in blood pressure to 80 mm. of mercury systolic and 20 mm. diastolic, and a precipitous drop in temperature from 103.6° F. to 95.2° F. (Chart 1). She responded well to routine shock therapy. Each evening on the two following days similar precipitous drops in temperature, to 96° F. and 96.4° F., respectively, took place without further manifestation of shock. Subjective improvement began within 24 hours after the chloramphenicol had been started. The patient recovered uneventfully and was discharged cured on April 28.

CASE 2: A 14-month-old white female infant was admitted with typhoid fever from the Children's Hospital to the contagious disease unit of the Los Angeles County General Hospital March 25, 1949. She had entered the Children's Hospital March 22 with a history of rhinitis, slight non-productive cough, and fever of 12 days' duration. Fever was remittent up to 101° F. rectally during the first five days, gradually rising to 104° F. The patient had been examined by the family physician four days before hospitalization and had been given penicillin. A red rash promptly developed over the nose and cheeks; it subsided in two days and was followed by desquamation. Immediately thereafter a widely scattered red papular rash appeared on the trunk and it persisted up to the time of hospitalization. On the day before admission a sulfonamide was given orally and one injection of penicillin was administered. There was a history of contact with the owner of the patient's apartment who had had typhoid fever about 30 years previously.

Upon physical examination at the Children's Hospital, the child was noted to be acutely ill with large scaling non-erythematous areas over the nose, cheeks, and above the left eye. There were widely scattered pinhead erythematous maculopapular rose spots over the trunk which faded with pressure. Rectal temperature was 104.5° F. The left tympanic membrane was dull. The throat was mildly injected and boggy. The heart and lungs were normal. The abdomen was soft. The liver and spleen were not palpable.

Urinalysis showed one plus albumin. The hemoglobin was 8.5 gm. per 100 cc., and leukocytes numbered 12,000 with 72 per cent neutrophils, 26 per cent lymphocytes, and 1 per cent each of monocytes and plasma cells. Roentgen-ray examination of the chest showed no abnormality. The spinal fluid was clear; it contained one cell per cu. mm.; reaction to Pandy's test was negative and there was no growth on a culture. Agglutination for typhoid antigen was positive in a dilution of 1:320 and negative for Para A, Para B, and Brucella. Blood and urine cultures were positive for E. typhosa.

The patient was given 30,000 units of penicillin every four hours until transfer to the Los Angeles County General Hospital. Fever continued at 104° F. for two days and then fluctuated between 100° F. and 104° F. rectally. Shortly after admission the spleen became palpable.

On admission to the contagious disease unit of the Los Angeles County General Hospital the patient was acutely ill, pale, toxic, and irritable when disturbed. The rectal temperature was 103° F., the pulse rate 130, respirations 26 per minute and the weight 28 pounds. There were numerous rose spots on the trunk which faded with pressure. Slight residual desquamation of the face persisted. The pharynx was slightly injected. The heart and lungs were normal. The abdomen was slightly distended and the tip of the spleen palpable.

Results of urinalysis were normal. Hemoglobin content of the blood was 9 gm. per 100 cc.; erythrocytes numbered 4,030,000, and leukocytes 9,700 with 55 per cent neutrophils. Following three successive daily blood transfusions, the hemoglobin was 15 gm., erythrocytes numbered 5,090,000 and leukocytes 9,700 with 51 per cent neutrophils. The blood CO_2 combining power was 45 volumes per cent and the non-protein nitrogen content was 20 mg. per 100 ml. of blood. Agglutination for E. typhosa was positive in dilution of 1:320 and negative for Para A, Para B, OX-19, and Brucella. There was no growth on a blood culture on March 28. Catheterized urine cultures were negative for E.

typhosa and positive for non-hemolytic (gamma) streptococcus on March 25, positive for E. coli, aerobacter aerogenes and proteus vulgaris on April 7, and negative on April 14 and 19. Four stool examinations were negative for E. typhosa.

The patient's course was acute during the first four days with remittent fever to 105° rectally. There were frequent loose green stools during the first few days. The patient was irritable, dehydrated, had slight abdominal distention, and refused oral feedings. Intravenous fluids and glucose and 150 ml. blood transfusions were given on three successive days. Fluids and food were also given by Levine tube. The patient was hydrated but continued toxic and acutely ill. Chloramphenicol was started March 28, approximately 18 days after the onset of illness with an initial oral dose of 0.75 gm. suspended in water, followed by 0.25 gm. every two hours until March 31, when the dose was reduced to 0.25 gm. every four hours until April 5. A total of 10 gm. was given during eight days. The patient became afebrile approximately 76 hours after therapy was started. Gradual improvement was noted during the first few days of treatment, the fever subsiding, and the patient appearing clinically well several days prior to the discontinuance of treatment. Recovery was uneventful and the patient was discharged cured on April 28.

Case 3: A 12-year-old white boy was admitted to the contagious disease unit of the Los Angeles County General Hospital on May 3, 1949, with typhoid fever. The present illness began abruptly on April 23 with high fever, daily bed-shaking chills, headache, vomiting and general malaise. The patient had been able to retain fluids the first few days, but vomited occasionally until entering the hospital. He had diarrhea but no bloody stools. Fever remained high with severe intermittent bed-shaking chills. He had been given 300,000 units of penicillin in procaine and oil several days after the onset of illness, by the family physician at home, with no effect on the clinical course. The patient was admitted to the Huntington Memorial Hospital, Pasadena, where aureomycin was given for two days without effect. A culture of the blood on the second day at the Huntington Hospital was positive for E. typhosa. The patient was then transferred to the contagious disease unit for treatment. Grandmother and mother had had typhoid fever some years before and were in contact with the patient.

Upon physical examination, the patient was noted to be obese. He was not acutely ill and was in no immediate distress. He complained only of headache and shaking chills. The temperature was 101.2° F., the pulse rate 90, respirations 28 per minute, the blood pressure 120 mm. of mercury systolic and 80 diastolic. The body weight was 200 pounds. There was no rash. The left tympanic membrane was slightly injected. The heart and lungs were normal. There was slight tenderness in the left hypochondrium. Peristalsis was active. The spleen was not palpable but was enlarged to percussion.

Results of urinalysis were normal. Hemoglobin content of the blood was 15 gm. per 100 cc. Leukocytes numbered 7,400 with 76 per cent neutrophils, 15 per cent lymphocytes and 9 per cent monocytes. Subsequent counts remained fairly constant. The prothrombin was 80 per cent of normal. In a number of determinations, the icteric index ranged between 10 and 12 units. The CO_2 combining power was 60 volumes per cent and the non-protein nitrogen 25 mg. per 100 cc. of blood. The serum albumin was 4.4 gm. and the globulin 2.2 gm. per 100 cc. A blood culture was positive for E. typhosa on admission and subsequently during a relapse. Agglutination for E. typhosa was positive in dilution of 1:160 and negative for Para A, Para B, OX-19, and Brucella. Numerous cultures of catheterized urine and of stools were negative for E. typhosa.

Chloramphenicol was started several hours after admission to the hospital on May 3, with an initial oral dose of 2.25 gm. suspended in water, followed by 0.25 gm. every two hours until May 6, when the dose was reduced to 0.25 gm. every four hours. The patient became afebrile in 48 hours. On May 9, the dose was increased to 0.75 gm. every four hours because of a relapse with the temperature going to 101.8° F. The temperature returned to normal in 12 hours. This dose was continued to May 14 when the drug was stopped. Subjective improvement in the patient's condition was noted within 48 hours after chloramphenicol was started. He was vomiting on admission but was subsequently able to retain food and the drug. A dicrotic pulse was noted the second day after admission. The patient's complaints ceased until May 26 when a second relapse occurred, characterized by severe headache, marked restlessness, general malaise, and fever. On the day of the second relapse a blood culture taken was positive for E. typhosa and the agglutination at the same time was positive in dilution of 1:160. Chloramphenicol therapy was reinstituted and the response was prompt. The temperature again returned to normal in 72 hours. In this course of treatment an initial dose of 2.25 gm. was followed by 0.5 gm. every two hours until June 6, when the dose was changed to 1.0 gm. every four hours for four doses and subsequently reduced to 0.75 gm. every four hours until June 11. Chloramphenicol was given for the first time on the 11th day of illness and the patient became afebrile seven days later. A total of 26.25 gm. was given in 12 days. Relapses occurred on the 16th day of illness, and again on the 34th day of illness, 12 days after chloramphenicol had been discontinued the first time. A total of 91 gm. of chloramphenicol was given over a 17-day period during the second relapse. During the entire illness 117.25 gm. of the antibiotic was given. In addition to antibiotic therapy the patient received several blood transfusions and routine care for typhoid fever. The patient was discharged cured on June 24.

Case 4: A 2½-year-old white male was admitted from the Huntington Memorial Hospital, Pasadena, to the contagious disease unit of the Los Angeles County General Hospital on May 7, 1949. He was first hospitalized on May 3 and the diagnosis of typhoid fever established by growth on a culture of the blood and by positive reaction to Widal's test. The urine was normal. A blood examination showed hemoglobin 12.4 gm. per 100 cc.; erythrocytes numbered 4,100,000, and leukocytes 5,950 with 69 per cent neutrophils. In roentgen examination of the chest, patchy bronchopneumonia at the base of the right lung was noted. The patient was given penicillin and streptomycin with no improvement. When the diagnosis of typhoid fever was established, one day before transfer to the Los Angeles County General Hospital, chloramphenicol was started, but because of vomiting the antibiotic was not retained.

The illness had begun April 26 with fever, listlessness, anorexia, vomiting and slight sore throat. The temperature remained high with late afternoon rises to 104° F. Vomiting persisted throughout the period prior to admission to the county hospital. There had been no bloody stools, diarrhea, or abdominal pain. The patient's mother and grandmother both had had typhoid fever many years ago.

Upon physical examination on May 7 the patient was noted to be acutely ill, pale, rational and oriented. The temperature was 103.8° F., the pulse rate 85, respirations 35 per minute, and the body weight 32 pounds. There were a few scattered rose spots on the abdomen. Mild bilateral conjunctivitis was present. The tonsils were enlarged and injected and there were several small ulcerated foci in the buccal mucosa of each side. The heart and lungs were normal. There was moderate distention of the abdomen. The spleen was palpable one finger-breadth below the costal margin. The liver edge was palpable and non-tender at the costal margin.

The urine was normal. The hemoglobin content of the blood was 12 gm. per 100 cc. Leukocytes numbered 4,500 with 60 per cent neutrophils. In subsequent blood examinations these factors remained fairly constant. A culture of the blood made at the time of admission was positive for E. typhosa. Serum agglutination for E. typhosa was positive in dilution of 1:320 and negative for Para A, Para B, OX-19, and Brucella. The CO_2 combining power was 48 volumes per cent and the non-protein nitrogen 34 mg. per 100 ml. of blood. The icteric index was 7 units. The serum albumin content was 3.8 gm. and globulin content 1.6 gm. per 100 cc. Repeated cultures of catheterized urine and of stools were negative for E. typhosa.

Chloramphenicol was started May 7, two hours after admission to the hospital, with an initial dose of 0.75 gm. suspended in water, followed by 0.25 gm. every two hours until May 12, when the dose was reduced to 0.25 gm. every four hours and continued until May 17. A total of 21.5 gm. was given in 11 days. It was started on the 11th day of illness and the patient became afebrile 72 hours later. The patient showed considerable subjective improvement and was able to retain fluids and medication the day after chloramphenicol was started. A transfusion of 150 ml. of blood was given the day after admission to the hospital. Recovery was uneventful and the patient was discharged as cured on May 31.

Case 5: A 55-year-old white female was admitted from the Huntington Memorial Hospital, Pasadena, to the contagious disease unit of the Los Angeles County General Hospital on May 19, 1949, with the diagnosis of psittacosal pneumonia. The illness had begun approximately two and a half weeks previously with anorexia, nausea, fever, frequent and painful urination, and diarrhea. Chills, cough, and abdominal pain were not noted. There was no blood in the stools. About three days before admission to the hospital dyspnea and orthopnea were noted and the patient had become "toxic" and much sicker. Aureomycin was given orally but emesis occurred. The patient's mother had had typhoid fever years previously. In the Memorial Hospital the patient was found to have a positive reaction to a Widal test in dilution of 1:640 and negative agglutinations for Para A, Para B, and Brucella. The referring physician reported significant positive complement fixation titer for psittacosis. There was moderate leukopenia and two plus albuminuria. The non-protein nitrogen was 38.5 mg. per ml. of blood. Roentgen examination of the chest revealed pneumonia in the right lung base. An electrocardiogram was normal.

Upon physical examination at the time of admission, May 19, the patient was noted to be obese, acutely ill, in a typhoid state, moderately dyspneic, dehydrated, lethargic and semi-stuporous. The facies were flushed. The temperature was 101° rectally, the pulse rate 122, the respirations 34, and the blood pressure 135 mm. of mercury systolic and 80 mm. diastolic. There were no discernible rose spots. The tongue was dry and coated, and there was a fetid oral odor. There were many fine crepitant rales at the right lung base. The abdomen was obese, soft, non-tender, with normal peristalsis apparent. The spleen was not palpable. No abnormalities were noted in a neurological examination.

On admission the hemoglobin was 13.5 gm. per 100 cc. of blood. Erythrocytes numbered 4,590,000 and leukocytes 4,700 with 62 per cent neutrophils and 38 per cent lymphocytes. These factors remained fairly constant in daily blood examinations. Agglutination was positive for E. typhosa in dilution of 1:320 and negative for Para A, Para B, OX-19, and Brucella. Result of a heterophil test was negative. On May 19 a culture of the blood was positive for E. typhosa.

Prior to admission to the Los Angeles County General Hospital the diagnostic issue had been confused by a reputed report of significantly positive complement fixation titer for psittacosis. Recovery of the typhoid organism came unexpectedly when the patient was being treated for psittacosal pneumonia. The previously reported positive complement fixation titer for psittacosis was not substantiated.

Chloramphenicol was started several hours after admission to the hospital with an initial dose of 6 gm. suspended in water divided hourly into three doses, followed by 0.50 gm. every two hours until the day of death. On that day the dose was increased to 0.75 gm. every two hours because of the grave clinical condition. A total of 31 gm. was given during the five days of hospitalization. The patient, however, retained very little of it due to intractable vomiting. Chloramphenicol was started during the third week of illness when the patient was acutely ill, and in a typhoid state. Several transfusions were given. The patient had continuous oxygen therapy and intravenous fluids. She became more stuporous and irrational, continued to vomit, and remained in a critical typhoid state. She was restless and noisy and sedation was necessary. The patient died May 23 with a terminal fever of 109° F. rectally.

Case 6: A 15-year-old Mexican male was admitted to the Los Angeles County General Hospital July 1, 1949. Illness had begun June 26 with headache, chills, fever, nausea, vomiting, diarrhea (six loose brown colored stools daily), and general malaise.

Upon physical examination at the time of admission the patient was observed to be acutely ill; he appeared toxic and confused. The temperature was 103.6° F. rectally, the pulse rate 80, the respirations 20, the blood pressure 102 mm. of mercury systolic and 60 mm. diastolic. The weight was 135 pounds. There were no rose spots. The heart and lungs were normal. The spleen was not palpable but seemed enlarged to percussion.

The hemoglobin content was 12.5 gm. per 100 cc. of blood. Erythrocytes numbered 4,500,000 and leukocytes 4,500 with 75 per cent neutrophils. These factors remained constant in subsequent examinations of the blood. The urine was normal. Result of a Wassermann test was negative. The spinal fluid was normal. The CO_2 combining power was 67 volumes per cent and the non-protein nitrogen was 37 mg. per 100 ml. of blood. The result of a heterophil agglutination test was negative. Cultures of blood, stool, and urine were positive for Eberthella typhosa on July 1, but negative following chloramphenicol therapy. Agglutinations for E. typhosa, Para A, Para B were negative on admission.

The patient was started on aureomycin on July 3, but the drug was discontinued the following day when the diagnosis of typhoid fever was established by culture. Aureomycin had no effect on the clinical course. On July 4 the patient was transferred to the contagious disease unit of the Los Angeles County General Hospital where chloramphenicol was started with an initial dose of 1.5 gm. suspended in water, followed by 0.50 gm. every four hours for three doses, 0.50 gm. every two hours for six doses, then 0.25 gm. every two hours until July 10, when the dose was changed to 0.50 gm. every four hours until July 15. A total of 33 gm. was given in 11 days. Chloramphenicol was started on the ninth day of illness and the patient became afebrile 24 hours later. Twelve hours after the first dose and after 3.0 gm. of the antibiotic had been given, the temperature dropped precipitously to 96° F. but without clinical evidence of shock. The temperature prior to the giving of chloramphenicol ranged between 100° F. and 105° F. rectally and the patient

TABLE 1.—*Chloramphenicol Therapy*

Case No.	Day of Disease Started	Ended	Dosage	Total Grams	Estimation of Effect
1.	12	22	Initial dose 2.5 gm., followed by .25 gm. every 2 hours for 5 days, then .25 gm. every 4 hours.	18	Good
2.	18	26	Initial dose .75 gm., followed by .25 gm. every 2 hours for 3 days, then .25 gm. every 4 hours.	10	Good
3.	11	22	Initial dose 2.25 gm., followed by .25 gm. every 2 hours for 3 days, then .25 gm. every 4 hours for 3 more days, then .75 gm. every 4 hours.	26.25	Good
	35	51	Initial dose 2.25 gm., followed by .50 gm. every 2 hours for 12 days, then .75 gm. every 4 hours.	91	Relapse Good
4.	11	22	Initial dose .75 gm., followed by .25 gm. every 2 hours for 5 days, then .25 gm. every 4 hours.	21.5	Good
5.	17	22	Initial dose 2 gm., followed by 2 gm. hourly for 3 doses, then .50 gm. every 2 hours until day of death when increased to .75 gm. every 2 hours.	31 ?	Died
6.	9	20	Initial dose 1.5 gm., followed by .5 gm. every 4 hours for 3 doses, then .5 gm. every 2 hours for 6 doses, then .25 gm. every 2 hours for 6 days followed by .5 gm. every 4 hours.	33	Good

had been acutely ill and toxic. The patient made an uneventful recovery and was discharged from the hospital as cured on August 4.

DISCUSSION

The diagnosis of typhoid fever was established in all six reported cases by positive blood cultures for Eberthella typhosa prior to the administration of specific therapy. At the time of isolation of the organism, tests for in vitro sensitivity to chloramphenicol were conducted. The organism in each case was found to be sensitive to less than 0.87 micrograms per 100 ml. of blood serum.

Chloramphenicol was administered orally with varying doses because of the general lack of knowledge of the optimal dosage, starting with a minimum of 50 mg. per kilogram of body weight as the initial dose. Adequate dosage is probably proportionate to the body weight.

Chloramphenicol therapy was initiated as soon as the diagnosis was established, usually between the ninth and 18th days of illness. The mean duration of illness was 13 days; the mean duration of treatment with chloramphenicol was nine days, excluding the second relapse in one patient (Case 3).

The response of four patients to chloramphenicol therapy was prompt, three becoming afebrile in three days and the fourth in 24 hours. All patients responded subjectively to treatment within 24 to 48 hours, reduced toxicity preceding or paralleling the return of temperature to normal. Repeated blood, urine, and stool cultures were negative following the initiation of chloramphenicol therapy in these cases.

In one patient (Case 3) two febrile relapses occurred, the first while chloramphenicol was being given and the second 12 days after the antibiotic had been discontinued. The first relapse, only febrile in nature, was promptly reversed by increased dosage, the patient becoming afebrile in 12 hours. The second relapse, in which a return of bacterial growth was noted, also abated promptly when chloramphenicol was reinstituted. A blood culture taken on the day of the second relapse was positive for Eberthella typhosa. It is apparent from this case and from those reported by Woodward that complete sterilization is not always attained with chloramphenicol. The prompt response to additional treatment, however, indicates that the typhoid organism does not lose its sensitivity to the antibiotic.

The one death was not ascribable unequivocally to failure of treatment. The patient was in a typhoid state, critically ill, with pneumonia a complicating feature, and in the latter part of the third week of illness when therapy was instituted. In addition to the duration of illness before institution of therapy, very little chloramphenicol was retained due to intractable vomiting.

An interesting reaction occurred in one patient following the administration of chloramphenicol. This patient went into shock seven and a half hours after the initial dose of the antibiotic, following a precipitous drop in temperature from 103.6° F. to 95.2° F. rectally. A similar crisis in temperature occurred on two successive evenings without the accompanying manifestations of shock (Chart 1). Response of the same type occurred in one of the other patients without evidence of shock. During the prolonged course of chloramphenicol therapy one of the patients (Case 3) showed definite signs of clinical avitaminosis characterized by a red, beefy tongue and changes in the oral mucous membranes. Similar signs of avitaminosis have been observed in other patients treated with large doses of chloramphenicol. Vitamin therapy is therefore advisable in all patients receiving that antibiotic. Except for the unusual reactions noted in two patients and signs of avitaminosis in one, chloramphenicol is well tolerated.

Three patients were inadvertently given aureomycin prior to chloramphenicol therapy with no clinical improvement. The dosage and length of treatment, however, were inadequate to evaluate the efficacy of this agent. Results reported by Collins[1] and collaborators on the use of aureomycin in the treatment of seven patients with typhoid fever are equivocal. Aureomycin did not alter the course of typhoid fever in four cases reported by Woodward;[9] two patients died following therapy. Although aureomycin has some beneficial effects, especially in vitro, the results in general are not striking. The authors' experience with aureomycin has been entirely disappointing. Two patients had nausea and vomiting following aureomycin, which interfered with subsequent chloramphenicol therapy.

It is apparent that chloramphenicol is at present the most efficacious of the available antibiotics in the treatment of typhoid fever. The optimum dosage and length of treatment are yet to be determined. It is suggested that patients in early stages of the disease respond quite dramatically to chloramphenicol, but that in advanced stages the antibiotic is less effective. The earlier treatment is instituted, the better the clinical response. Perhaps a longer period of treatment with chloramphenicol is necessary in each case if relapse is to be prevented. The observations of Smadel[5] indicate a striking relation between the duration of chloramphenicol therapy and the incidence of relapses.

REFERENCES

1. Collins, H. S., et al.: Aureomycin—a new antibiotic: Evaluation of its effects in typhoid fever, severe salmonella infections and in a case of colon bacillus bacteremia, Ann. Int. Med., 29:1077-1092, 1948.

2. Gottlieb, D., et al.: Some properties of antibiotic obtained from species of streptomyces, J. Bact., 55:409-417. March 1948.

3. J.A.M.A., 138:432, 1948: Chloromycetin (editorial).

4. McDermott, W., et al.: Chloromycetin in typhoid fever. Unpublished. Paper presented at Association of American Physicians in Atlantic City May 3, 1949.

5. Smadel, J. E., et al.: Relation of relapses in typhoid to duration of chloramphenicol therapy, J.A.M.A., 141:129. Sept. 10, 1949.

6. Smith, R. M., et al.: Chloromycetin: Biological studies. J. Bact., 55:425-448, March 1948.

7. Stiller, R.: Typhoid fever treated with chloromycetin. J. Ped., 35:85-87, July 1949.

8. Woodward, T. E., et al.: Preliminary report on the beneficial effect of chloromycetin in the treatment of typhoid fever, Ann. Int. Med., 29:131-134, 1948.

9. Woodward, T. E.: Chloromycetin and aureomycin: Therapeutic results. Ann. Int. Med., 31:53-82, 1949.

* * *

Cardiac Catheterization in Adult Congenital Heart Disease

A Preliminary Report

George C. Griffith, M.D., Richard S. Cosby, M.D., and
David C. Levinson, M.D., *Los Angeles*

SUMMARY

The diagnosis of uncomplicated ventricular septal defect and uncomplicated patent ductus arteriosus presents few hazards. Differential diagnosis of atrial septal defect and of transposed pulmonary veins is technically more difficult. The complex nature of most types of cyanotic congenital heart disease requires the combined use of catheterization, determination of circulation times, ventilation studies, and possibly angiocardiography.

Reports of eight cases in which cardiac catheterization was carried out illustrate the common forms of acyanotic and cyanotic heart disease and the factors in diagnosis.

THE purpose of this presentation is to illustrate the value of cardiac catheterization in study of congenital heart disease in adults.

MATERIAL AND METHOD

For purposes of report, eight cases of adult congenital heart disease in which catheterization was carried out at the Los Angeles County General Hospital during the years 1948 and 1949 were selected. Routine clinical work-up was followed by electrocardiography and fluoroscopy in each case. Catheterization of the heart was then carried out by the method of Cournand and co-workers.[2] Oxygen content of blood samples was measured by the Van Slyke method. The intracardiac pressures were measured by a variety of techniques including simple saline manometer, electromanometer, and by multichannel recording with strain gauge manometers.

The diagnostic value of cardiac catheterization depends primarily on the correlation of three separate kinds of information—pressure, oxygen content, and catheter position. Normal "standards" and criteria for abnormal hearts have not been universally accepted. The standards probably will change with further refinements in technique. Technical difficulties during the procedure may materially alter results. Illustrative are tachycardia induced by the "touch" effect of the tip of the catheter against the right ventricular wall, a febrile reaction during the procedure, or a change in heart rate such as may be caused by excitement. Physiologic determinations (sampling, pressures, etc.), should be made as rapidly as possible to help circumvent these problems. The technical difficulties in Van Slyke determinations and in pressure determinations appear less variable.

I. NORMAL VALUES

1. *Atrium and Great Veins*

Normally, the superior and inferior vena cava contain blood of low oxygen content; that of the inferior vena cava is usually higher than that of the superior vena cava. Under resting conditions in the normal patient, oxygen content of superior and inferior cava blood lies between 12 and 14 volumes per cent. This presupposes the normal A-V difference of 4 to 5 volumes per cent and a normal hemoglobin content of 15 grams per 100 cc. of blood. Inferior cava blood may have oxygen content as much as 2 volumes per cent higher than does superior cava blood. This difference is presumably due to the high oxygen content of renal venous blood.

The pressure in the great veins is normally the lowest in the cardiovascular system, and varies somewhat with normal respiratory excursion. It consists of a, c, and v waves, the familiar venous pulse.

Oxygen content of right atrial blood is representative of a mixture of superior and inferior cava blood, together with the extremely unsaturated coronary sinus blood. The oxygen content of the latter is usually around 4 volumes per cent with the patient in the resting state. Right auricular oxygen content, then, may vary considerably, depending upon the proximity of the tip of the catheter to the opening of the coronary sinus, to the superior vena caval stream or to the inferior vena caval stream.

2. *Right Ventricle*

The form of the pressure wave within the right ventricle is exactly similar in contour in the normal resting state to that of the left ventricle, but the peak systolic pressure is approximately one-fourth that of the left side of the circulation, usually from 20 to 25 mm. of mercury. The form of the curve is that of an inverted "U" with rather similar ascending and descending limbs. The pressure during diastole falls to a level of 0 to 2 mm. of mercury. Oxygen content is that of a mixture of superior and inferior cava blood and blood from the coronary sinus. It may be slightly higher or slightly lower than the content in the right auricle by a difference of 1 volume per cent, depending upon the site from which the sample from the right atrium is taken.

From the Department of Medicine, Cardiology, School of Medicine, University of Southern California; and from the Los Angeles County Hospital.

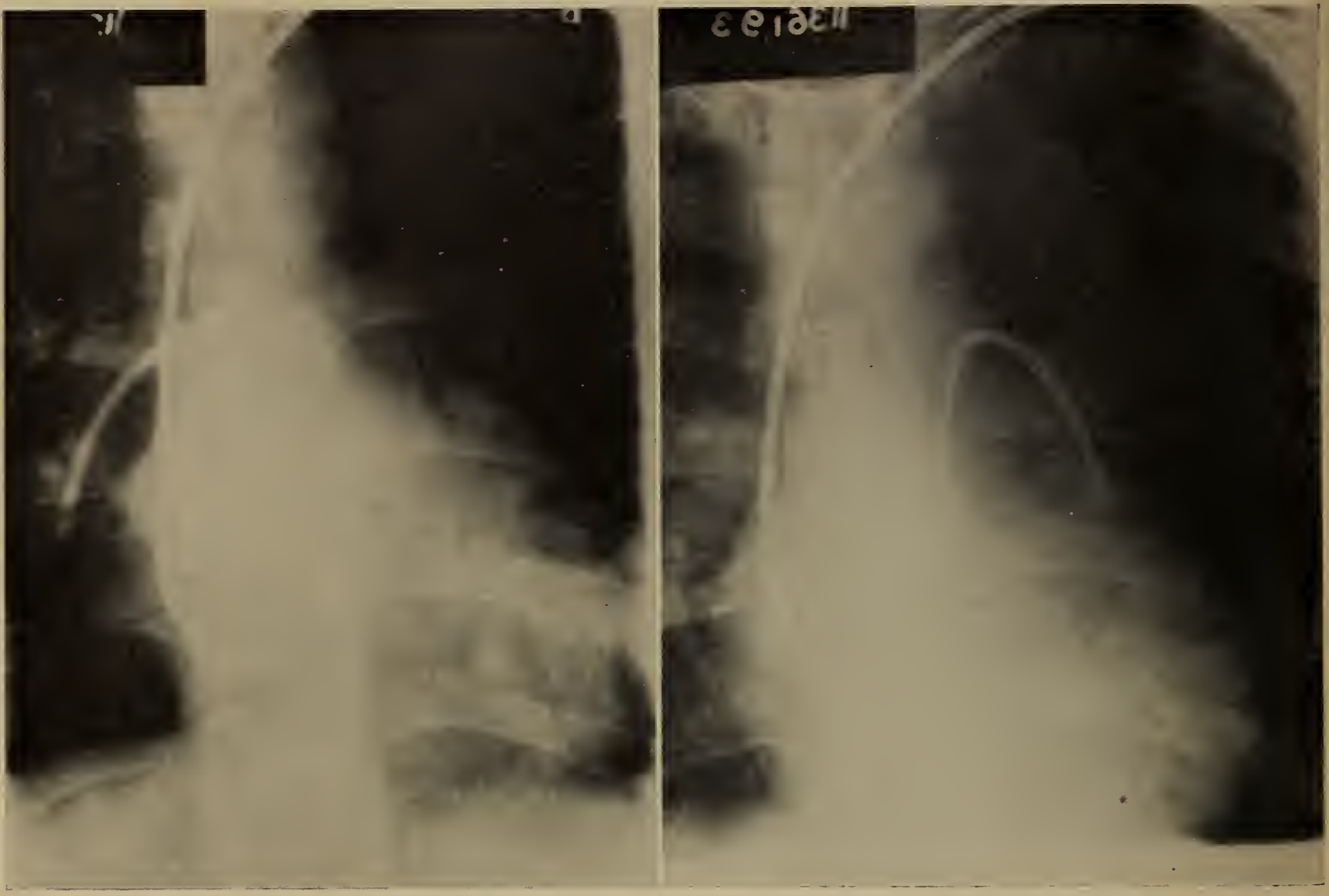


Figure 1.—*Left,* catheter in right pulmonary artery. *Right,* catheter in left pulmonary artery.

3. *Pulmonary Artery*

Normal pulmonary artery pressure curves closely resemble those of the aorta in contour and are approximately one-fourth as high in both systolic and diastolic values. Peak systolic pulmonary artery pressure always is identical to peak right ventricular systolic pressure. The oxygen content in the pulmonary artery should not vary from that of the right ventricle by more than 0.5 volumes per cent. Catheter positions in right and left pulmonary artery are illustrated in Figure 1.

However, as the catheter is passed toward the smaller pulmonary radicals, oxygenated blood appears either from collateral bronchial channels or from the pulmonary capillaries themselves. Such pure "pulmonary capillary blood" usually has oxygen content about 1 volume per cent higher than does peripheral arterial blood.[4]

II. ABNORMALITIES—ACYANOTIC CONGENITAL HEART DISEASE

1. *Transposed Pulmonary Veins*

Occasionally pulmonary veins empty directly into the superior vena cava and/or right atrium. Such an abnormality must be carefully distinguished from an atrial septal defect. Completely oxygenated blood under low, nonpulsatile pressure is present. It must be shown that the catheter has passed from superior vena cava into transposed pulmonary vein or from right atrium into transposed pulmonary vein without having passed through the left atrium.

2. *Atrial Septal Defect*

In atrial septal defect, a complete diagnosis can be made only by demonstrating passage of the catheter through the defect. Ideally, a double lumen catheter should be used and simultaneous pressure and oxygen value determinations obtained from right and left atrium. The tip of the catheter in the left atrium should record a slightly higher pressure than that in the right atrium; and from the tip in the left atrium, fully oxygenated blood is withdrawn. The proximal barrel of the double lumen catheter records the lower right atrial pressure curve and a lower "venous" oxygen content. Ordinarily, in atrial septal defect, right atrial oxygen content should be more than 2 volumes per cent above that of superior vena cava blood. It is important that the atrium be "explored" by means of multiple sampling of oxygen content.

Such data apply to isolated atrial septal defects in which the predominant shunt is from left to right. In the presence of pulmonary stenosis or other causes of right ventricular hypertrophy, where the principal intracardiac shunt is from right to left, and the tricuspid valve is incompetent, oxygen gradients may not be as striking. Superior vena cava oxygen may not differ appreciably from right atrial oxygen, and left atrial oxygen content may be lower than normal.[5]

PRESUMPTIVE INTERATRIAL SEPTAL DEFECT

Case 1: A 27-year-old white female was referred for cardiac catheterization to confirm a diagnosis of interatrial septal defect. The growth and development of the patient had been normal. In 1943, while in the Navy, she had an attack of rheumatic fever and a heart murmur was first detected at that time.

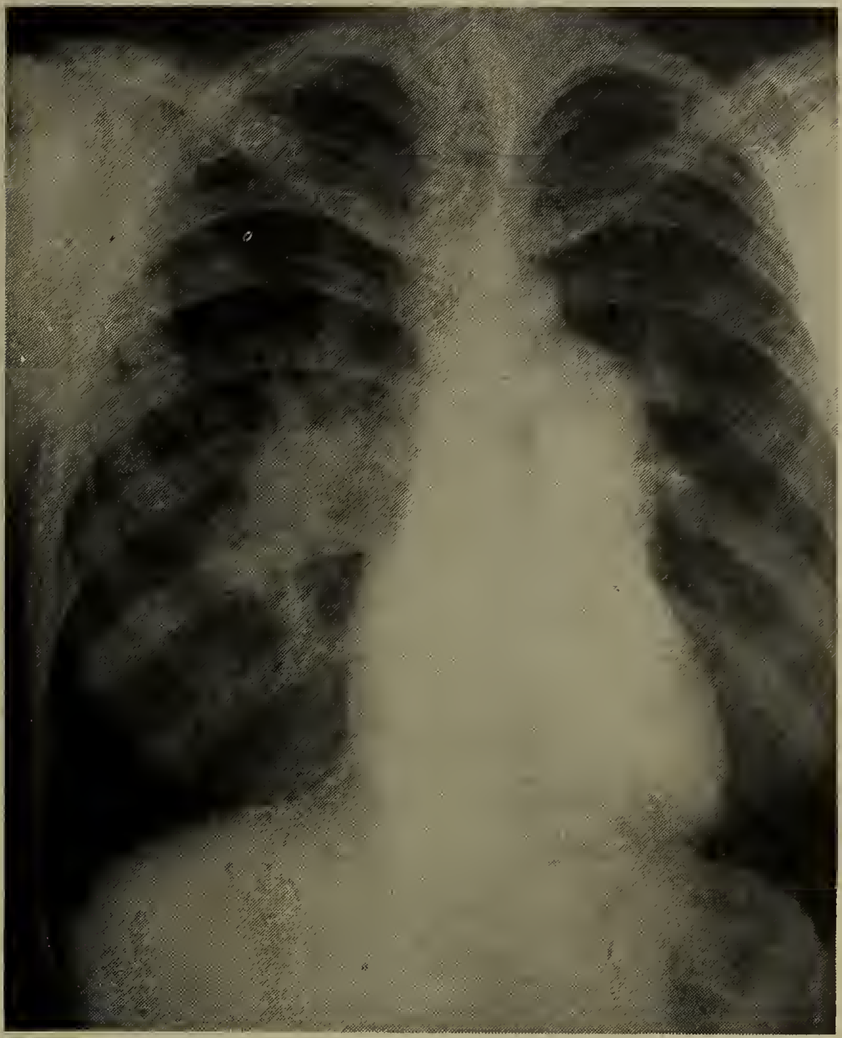


Figure 2, *A*

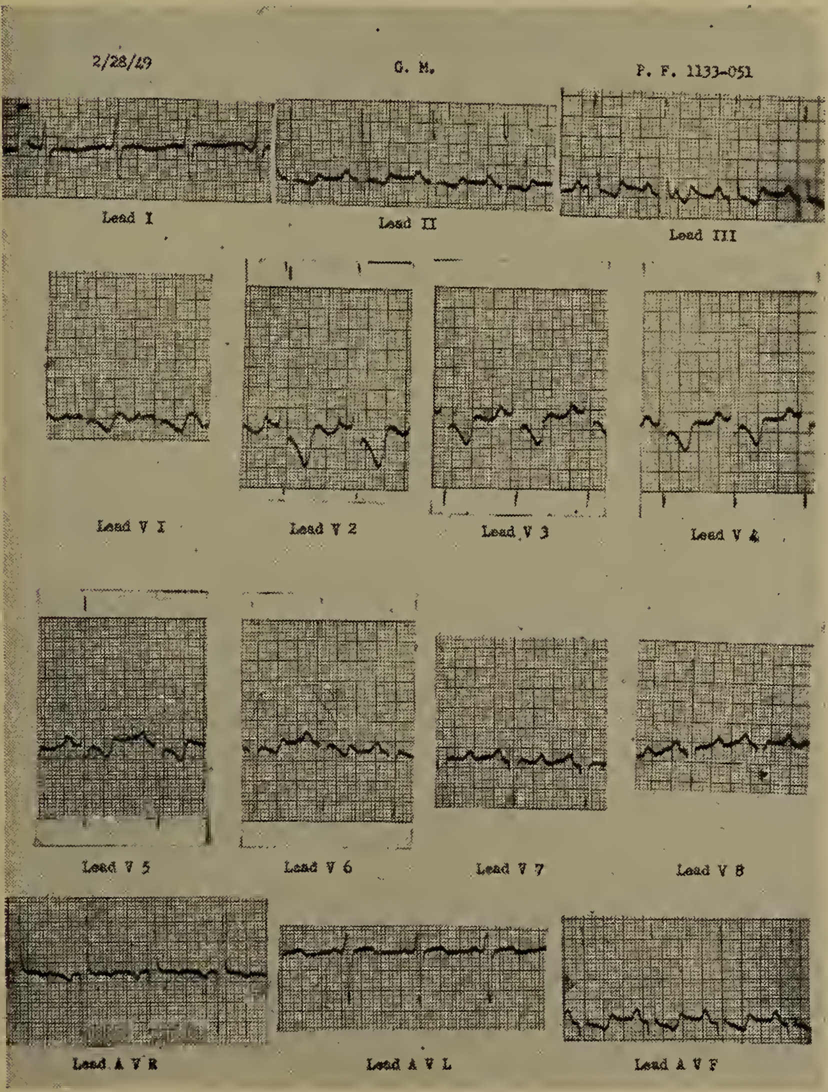


Figure 2, *B*

The patient was well developed, appeared to be well nourished and was in no acute distress. The temperature was 98.5° F., the pulse rate was 78 per minute, and the respiratory rate 20 per minute. The lungs were clear. Grade I cardiac enlargement was present. The point of maximum impulse was in the fifth intercostal space, 1 cm. outside the mid-clavicular line. P_2 and M_1 were accentuated. There was a grade V high-pitched blowing diastolic murmur, and a grade II systolic murmur at the pulmonary area.

In an orthocardiogram (Figure 2, *A*) the pulmonary arc was prominent. Pronounced dilation of the right pulmonary artery was noted in the right oblique position. The pulmonary arteries were pulsating. Right ventricular enlargement was present.

An electrocardiogram (Figure 2, *B*) gave evidence of right ventricular hypertrophy.

The hemoglobin content was 15.3 gm. per 100 cc.

Results of the cardiac catheterization are recorded in Table 1.

The diagnosis of interatrial septal defect in this patient was presumptive because of (1) an increase

Table 1.—*Patent Interatrial Septal Defect*

Station	Mean Pressure (mm. of Hg.)	Oxygen (Vols. %)	Oxygen Saturation (Per Cent)
1. Bifurcation of the pulmonary artery	59	14.45	69.6
2. Right ventricle	34	14.20	68.5
3. Right atrium	1 – 2	15.40	74.2
4. Superior vena cava	1 – 2	11.60	55.8
5. Left atrium	3 – 4	18.25	87.9
6. Left pulmonary vein	None	18.55	89.3

Note: With hemoglobin 15.3 gm. per 100 cc., 20.7 vol. % O_2 the saturation would be 100%.

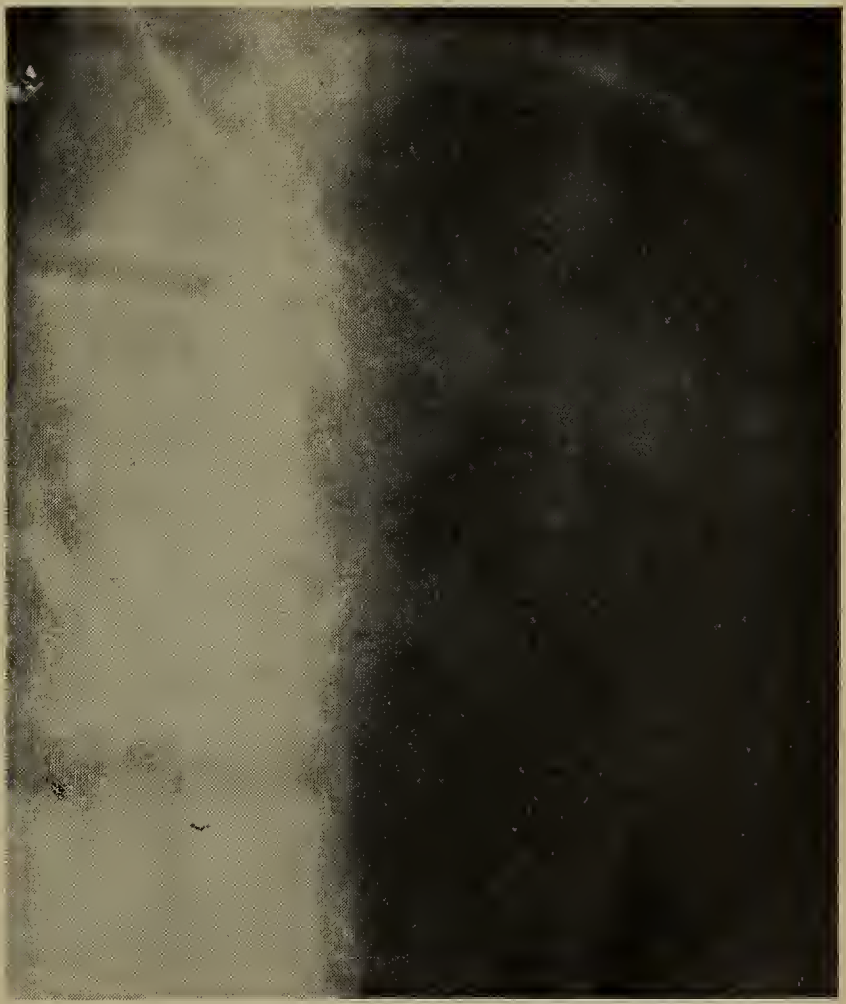


Figure 2, *C*

of oxygen content from 11.5 volumes per cent in the superior vena cava to 15.4 volumes per cent in the right auricle, and (2) because it was presumed that the catheter passed through the defect into the left auricle and out into a pulmonary vein (Figure 2, *C*). To rule out transposed pulmonary vein would have necessitated simultaneous pressure and oxygen recordings with the double lumen catheter in two positions, right atrium-left atrium, and left atrium-pulmonary vein.

3. *Ventricular Septal Defect*

An increase in oxygen content of greater than 1 volume per cent between right atrium and right ventricle is indicative of ventricular septal defect. The ventricular pressure and oxygen content depend upon (1) the size of the defect present, and (2) the proximity of the catheter to the defect itself. Occasionally the tip of the catheter may be passed through the defect, and left ventricular pressure curves may be recorded together with the sampling of fully oxygenated blood.

HIGH INTERVENTRICULAR SEPTAL DEFECT

CASE 2: A 21-year-old Japanese-American female with a history of heart disease since birth was admitted for cardiac catheterization. The only complaint was of dyspnea on exertion.

The patient was underweight. There was no dyspnea, orthopnea, cyanosis or clubbing. The pulse rate was 72 per minute. The blood pressure was 110 mm. of mercury systolic and 70 mm. diastolic. The lungs were clear. In examination of the heart the point of maximum intensity was noted in the fifth interspace at the anterior axillary line. There was a prominent systolic thrill at the second and third intercostal spaces to the left of the sternum. A grade IV systolic murmur was heard at the pulmonic area and it was transmitted to the left clavicle. A grade II pulmonary diastolic murmur was also present. P_2 was accentuated.

An orthocardiogram (Figure 3, *A*) showed that the vascular markings in both lung fields were increased, and that pronounced pulsations of the pulmonary arteries were present. The pulmonary arc was prominent. In the left oblique, both right and left ventricles were enlarged and there was a small right atrial shelf. In the right oblique the left atrium was enlarged.

An electrocardiogram showed right axis deviation (Figure 3, *B*).

Prior to catheterization, this patient was thought to have either an interatrial septal defect or a high interventricular septal defect. The results of the cardiac catheterization are recorded in Table 2.

The oxygen content of the blood in the right ventricle was approximately 2 volumes per cent higher than that of the right atrium. This established a diagnosis of interventricular septal defect. The fact

TABLE 2.—*Interventricular Septal Defect*

Station	Oxygen Content (Vols. %)	Mean Pressure (mm. of Mercury)
1. Coronary sinus	4.30	9
2. Pulmonary conus	15.70	30
3. Right ventricle	15.80	41
4. Right atrium	13.70	0
5. Superior vena cava	12.90	0
6. Femoral artery	17.45	—

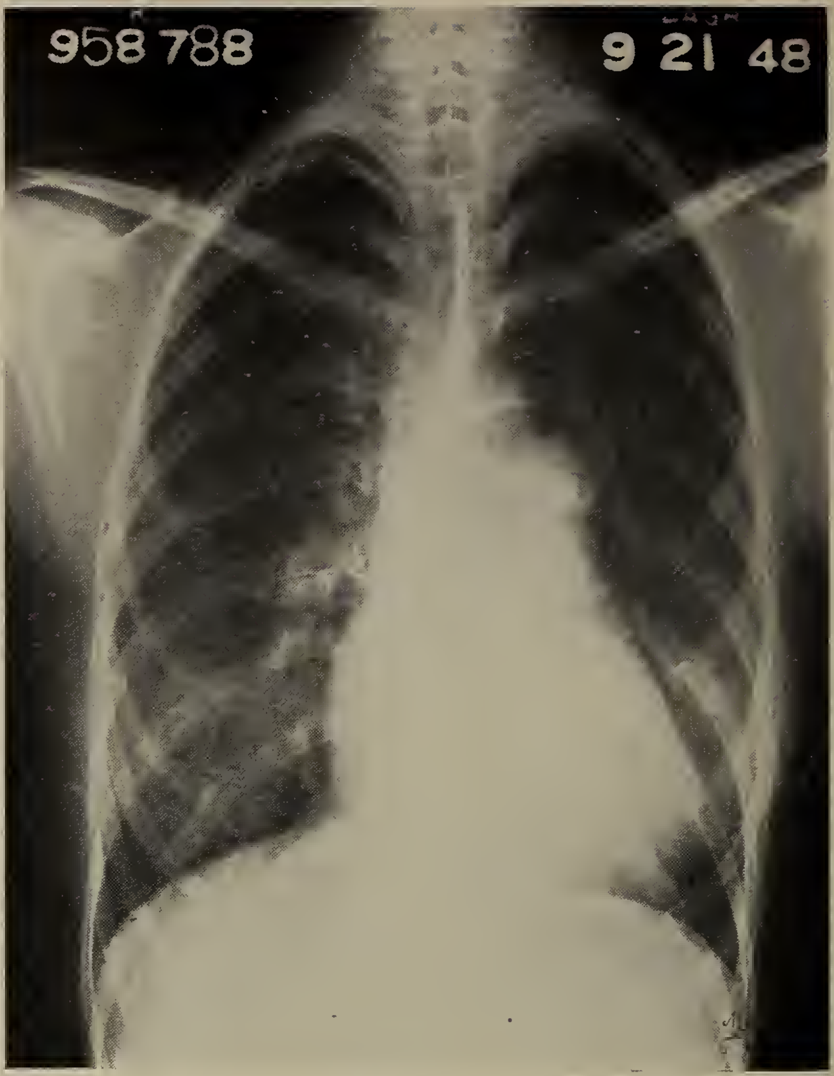


Figure 3, *A*

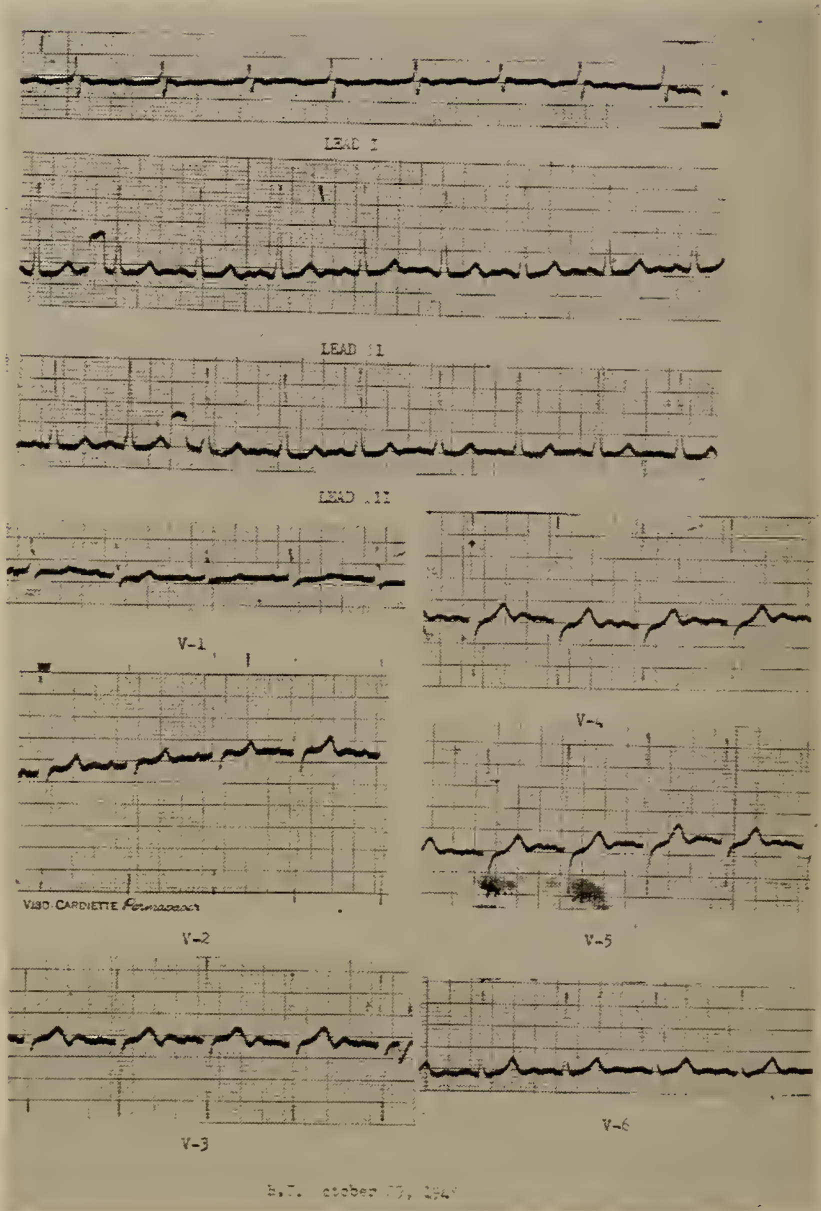


Figure 3, *B*

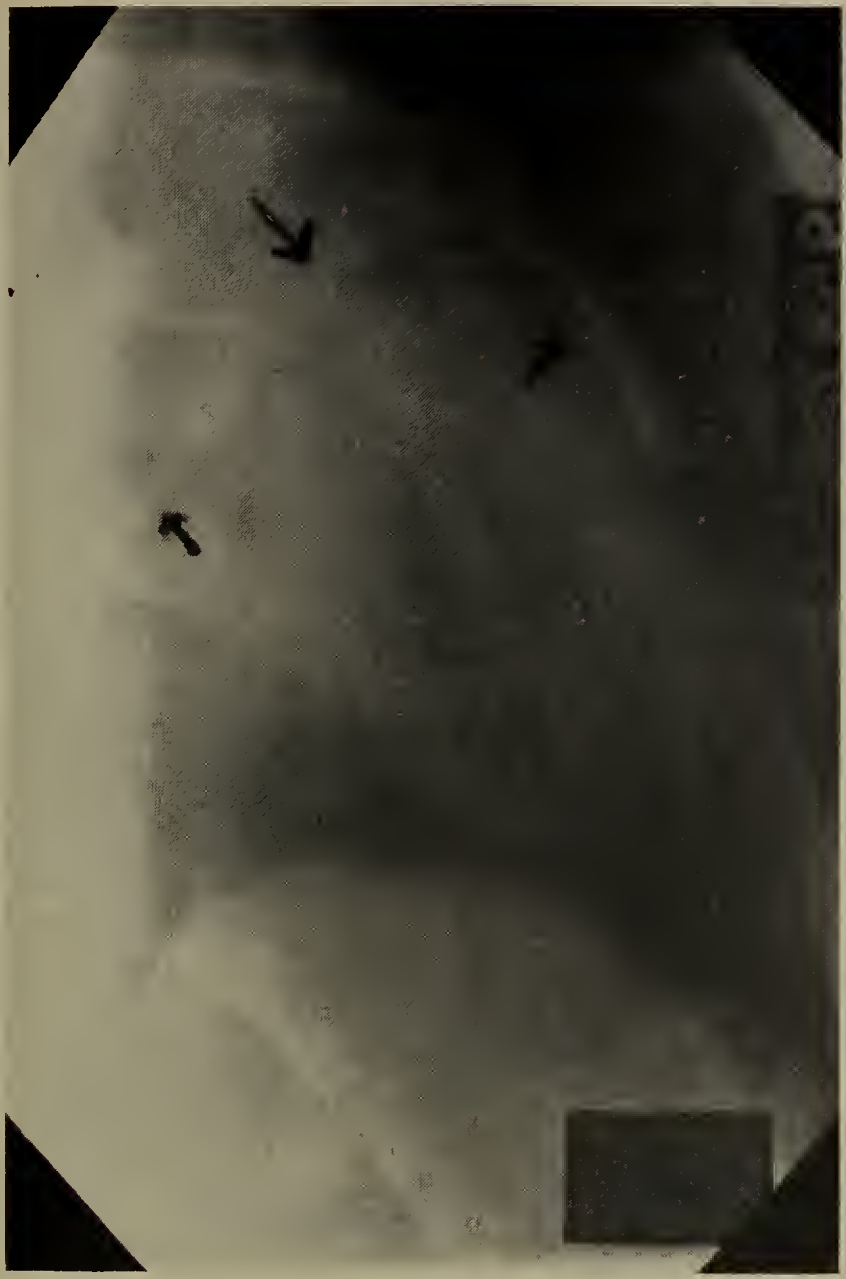


Figure 3, *C*

that the oxygen content of the blood in the right atrium was 0.8 volume per cent higher than that of the superior vena cava could possibly represent a very small interatrial septal defect. The catheter was fortuitously passed into the coronary sinus (Figure 3, *C*), and there the oxygen content was 4.3 volumes per cent. The increase in pressure in the right ventricle was secondary to the pulmonary hypertension.

4. *Patent Ductus Arteriosus*

An increase in oxygen content greater than 0.5 volume per cent between right ventricle and main pulmonary artery is indicative of some type of aortic-pulmonary shunt, usually patent ductus arteriosus. It also may be indicative of a shunt between left ventricle and pulmonary artery (high intraventricular septal defect, either alone or in combination with other defects). The actual form of the pressure curve and the degree of increase of oxygen content depends, as in ventricular septal defect, upon the size of the defect and the proximity of the catheter tip.

Case 3: A 32-year-old white female with a history of heart disease was referred for cardiac catheterization to confirm the diagnosis of patent ductus arteriosus. The growth and development of the patient had been normal.

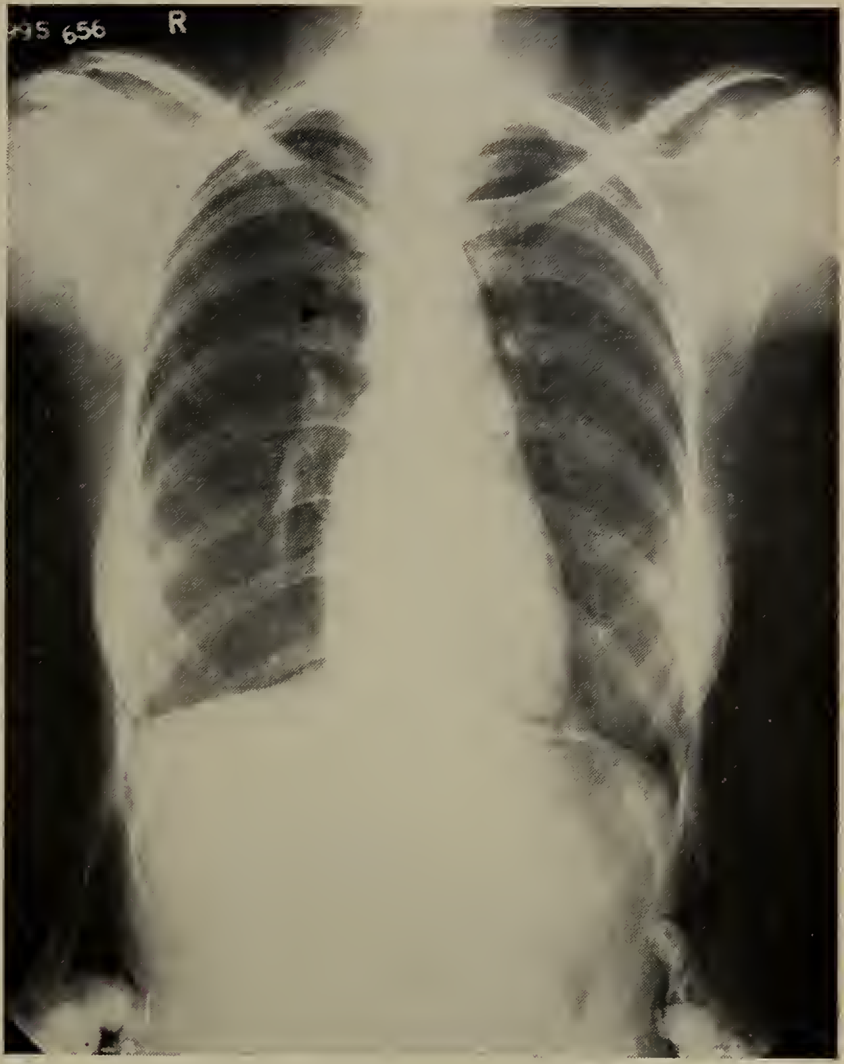


Figure 4

Table 3.—*Patent Ductus Arteriosus*

Station	Oxygen Content (Vols. %)	Mean Pressure (mm. of Mercury)
1. Right pulmonary artery	16	25
2. Bifurcation of main pulmonary artery	16.05	29
3. Right ventricle	14.04	16
4. Right atrium	14.5	7

The patient was thin and underdeveloped. There was no dyspnea, cyanosis or clubbing. The pulse rate was 72 per minute. The blood pressure was 115 mm. of mercury systolic and 60 mm. diastolic. The lungs were clear. A continuous "machinery" murmur over the pulmonic area was noted in examination of the heart.

An orthocardiogram (Figure 4) showed increased vascular markings, and the pulmonary arteries were described as pulsating. The heart was of normal size, and the pulmonary conus was prominent.

An electrocardiogram was normal. The hemoglobin content was 17.6 gm. per 100 cc. of blood. Results of cardiac catheterization are recorded in Table 3.

In this case, the oxygen content of the blood taken from the pulmonary artery was significantly higher (2 volumes per cent) than that in the right ventricle. This confirmed the diagnosis of patent ductus arteriosus. It is to be noted again that position of the tip of the catheter determines the oxygen and pressure values, and that the optimum position is at or near the bifurcation of the pulmonary artery. Calculation of the size of any left-to-right shunt by the usual methods may vary considerably depending upon the location of the catheter tip.[2]

5. *Isolated Pulmonary Stenosis (Non-Cyanotic)*

The diagnosis of pulmonary stenosis rests upon the finding of an abrupt rise of pulmonary systolic pressure during withdrawal of the catheter through the pulmonary valve. Ordinarily in this abnormality the pulmonary artery systolic pressure will be below 25 mm. of mercury, and the right ventricular systolic pressure considerably above that level. The diagnosis is reasonably accurate, since, under normal conditions, the systolic pressure in both pulmonary artery and right ventricle is identical. Oxygen saturation in isolated pulmonary stenosis is usually within the normal range in the peripheral arterial circulation, as the blood passing through the lungs is completely oxygenated, and there are no right-to-left intracardiac shunts.

Case 4: A 25-year-old Negro female with a history of dyspnea on exertion since childhood and ankle edema for the previous 12 months was admitted for cardiac catheterization.

The patient appeared to be in no acute distress. The temperature was 98.6° F., the pulse rate 82 per minute, and the respiratory rate 18 per minute. The blood pressure was 132 mm. of mercury systolic and 94 mm. diastolic. The neck veins were pulsating. The lungs were clear. Grade II cardiac enlargement was present. The point of maximum intensity was in the fifth intercostal space, 3 cm. outside the midclavicular line. P_2 was accentuated. There was a grade III systolic murmur at the pulmonic area transmitted toward the left clavicle. The liver, which was palpated three fingers' breadth beneath the right costal margin, pulsated.

An orthocardiogram (Figure 5, *A*) showed marked cardiac enlargement, chiefly right ventricular, with a prominent pulmonary arc. The pulmonary vascular markings were considerably diminished.

An electrocardiogram gave evidence of right ventricular hypertrophy (Figure 5, *B*).

Erythrocytes numbered 5.5 million, and the hemoglobin content was 17 gm. per 100 cc. The results of cardiac catheterization are recorded in Table 4.

The catheter could not be passed into the pulmonary artery. The finding of a pressure of 97 mm. of mercury in the right ventricle was consistent with the clinical and roentgenologic impression of pure pulmonary stenosis. The inability to introduce the catheter through the pulmonary valve was an additional suggestive finding. The presence of 91 per cent oxygen saturation in the femoral artery indicated complete oxygenation of pulmonary blood, and the absence of a right-to-left intracardiac shunt. These three findings—(1) starved lungs, with high right ventricular pressure, (2) the inability of the catheter to enter the pulmonary artery and (3) normal arterial oxygen saturation—established the presumptive diagnosis of pure pulmonary stenosis. Illustrative cases of pulmonary stenosis with *diagnostic* pressure gradients from right ventricle to pulmonary artery will be reported later in this presentation (Cases 5 and 6).

Table 4.—*Pure Pulmonary Stenosis*

Station	Mean Pressure (mm. of Hg.)	Oxygen (Vols. %)	Oxygen Saturation (Per Cent)
1. Right ventricle	97	10.37	49.1
2. Right atrium	19	9.99	48.8
3. Subclavian vein	19	9.97	46.7
4. Femoral artery		18.8	91.7

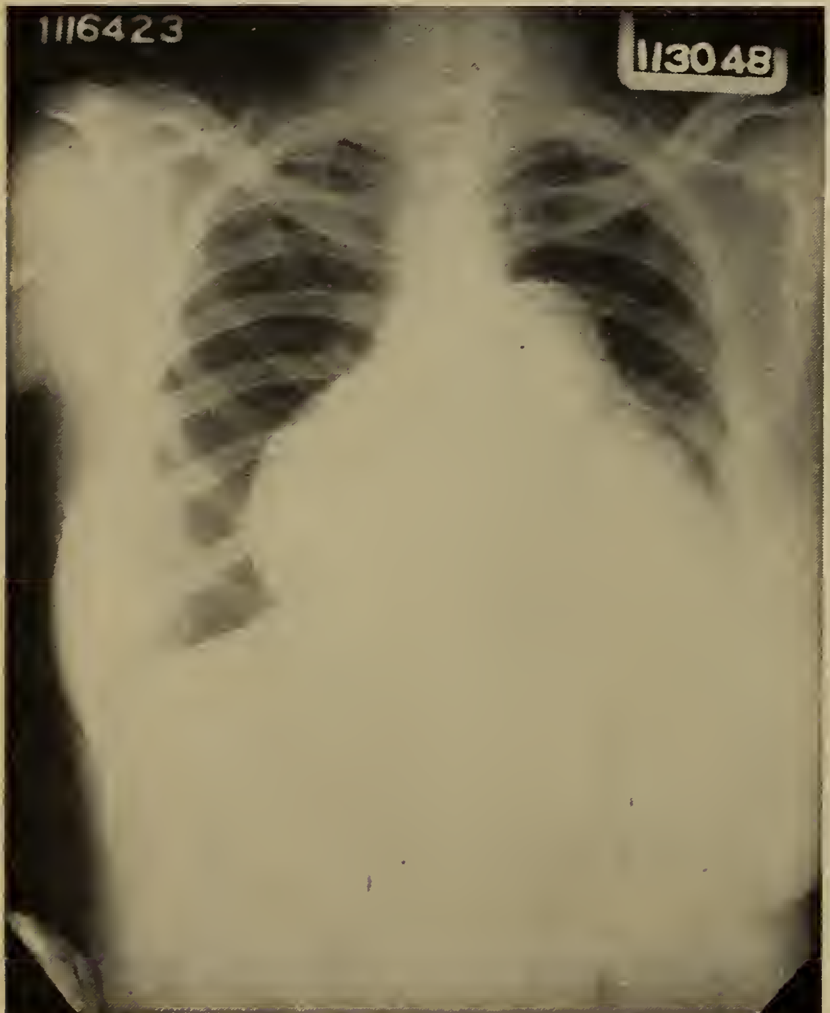


Figure 5, *A*

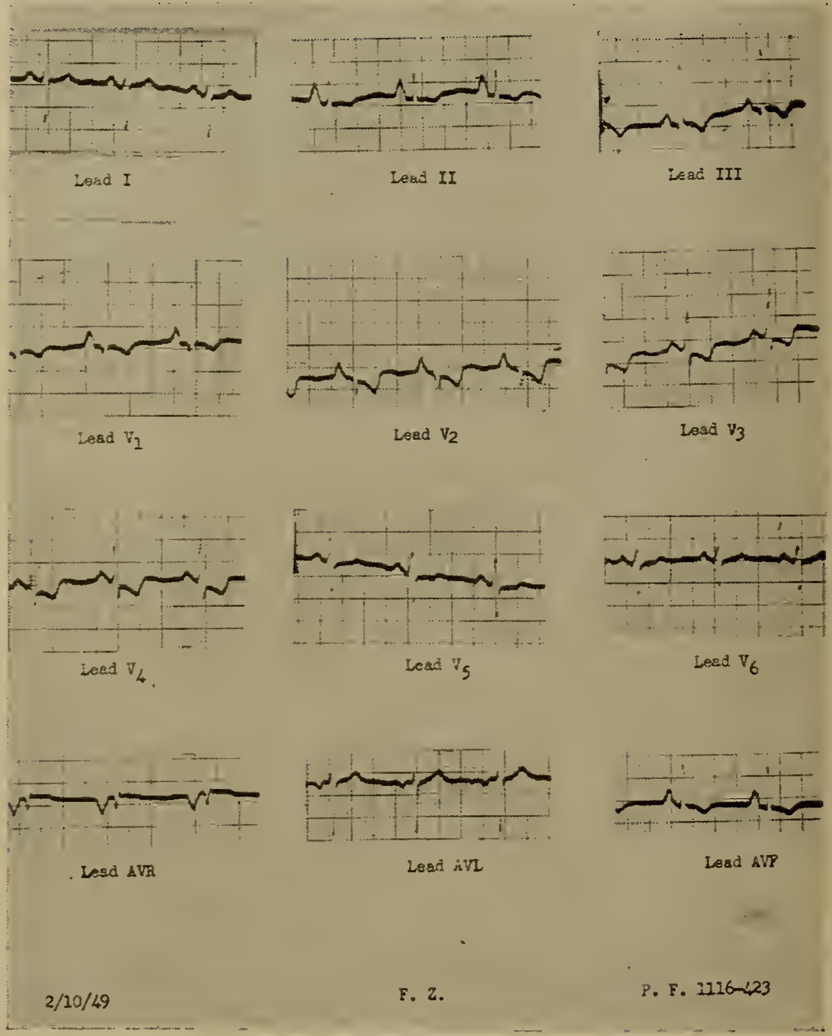


Figure 5, *B*

III. CYANOTIC CONGENITAL HEART DISEASE

1. *Tetralogy of Fallot*

The tetralogy of Fallot is the commonest type of cyanotic congenital heart disease and consists of (1) an interventricular septal defect, (2) dextroposition of the aorta, (3) right ventricular hypertrophy and (4) pulmonary stenosis.

It is not always possible, with the technique of cardiac catheterization, to arrive at a "complete" physiologic diagnosis. Nevertheless, significant and valuable information is almost invariably obtained. The data may be subdivided thus:

1. *Pulmonary stenosis.* This is the crucial determination, and, as was noted earlier, is determined best by the rise of systolic pressure during continuous withdrawal of the catheter from pulmonary artery to right ventricle. In addition, information may be gathered as to the actual presence of one or both pulmonary arteries, provided that the catheter is manipulated into the terminal portion of each pulmonary artery.

2. *Hypertrophy of the right ventricle.* This is a result of pulmonary stenosis and is evidenced by (a) elevated right ventricular systolic pressure, (b) right axis deviation with evidence of hypertrophy in the electrocardiogram, and (c) fluoroscopic demonstration of right ventricular enlargement.

3. *Dextroposition, or overriding aorta.* Four methods are available to demonstrate overriding: (a) arm-to-tongue circulation time (approximates arm-to-lung time), (b) angiocardiography will reveal the early presence of dye in the aorta when it can be definitely proven that dye has passed directly from right atrium to right ventricle to aorta, (c) the catheter itself may be seen to pass from apparent right ventricle to aorta, (d) a right ventricular systolic pressure equal to aortic systolic pressure is fairly good evidence for the presence of overriding. It is apparent that no one of the above methods is infallible, and all should be utilized during cardiac catheterization.

4. *Interventricular septal defect.* This defect in cyanotic heart disease is not simple to demonstrate by the technique of catheterization, since the shunt may be mainly from right to left. This septal defect may be assumed to be present when overriding of the aorta is demonstrated.

The differentiation of tetralogy of Fallot from the tetralogy of Eisenmenger requires, in addition, the determination of oxygen consumed per liter of ventilation and the determination of changes in arterial oxygen saturation with exercise. In the tetralogy of Fallot the arterial oxygen saturation falls with exercise, as does oxygen consumed per liter of ventilation.[1] In the tetralogy of Eisenmenger the arterial oxygen saturation falls with exercise, and the oxygen consumption per liter of ventilation rises.

CASE 5: A 21-year-old white male with a history of cyanosis and clubbing since four years of age was admitted for cardiac catheterization. The only complaint was that of dyspnea on moderate exertion.

The patient was moderately underdeveloped. Pronounced cyanosis of the skin and mucous membranes was noted. There was clubbing of the fingers, toes, and nose. The temperature was 98° F., the pulse rate 120 per minute and the respiratory rate 20 per minute. The blood pressure in the right arm was 118 mm. of mercury systolic and 90 mm. diastolic; in the left arm, 115 mm. systolic and 100 diastolic. The lungs were clear. There was a harsh grade III systolic murmur best heard over the third and fourth left interspaces and transmitted well in all directions. P_2 was louder than A_2.

An orthocardiogram showed some decrease in the peripheral lung markings. The cardiac silhouette was not enlarged. In the right oblique the pulmonary artery appeared quite small (Figure 6, *A*).

An electrocardiogram gave evidence of right axis deviation with pronounced clockwise rotation of the heart (Figure 6, *B*).

The hemoglobin content of the blood was 23 gm. per 100 cc. Erythrocytes numbered 8.5 million, and leukocytes 7,600.

The results of cardiac catheterization are recorded in Table 5. In Figure 6, *C* there are simultaneous pressure

TABLE 5.—*Tetralogy of Fallot*

Station		Oxygen Content (Vols. %)	Oxygen Saturation (Per Cent)	Pressure (mm. of Hg.)	
				Systolic	Diastolic
1. Main pulmonary artery		17.54	48.5	25 to 33	18 to 21
2. Right ventricle	*High*	18.7	51.7	155 to 167	28 to 32
	Low	17.80	49.3		
3. Right atrium		17.65	48.8	15 to 20	5 to 10
4. Superior vena cava		19.88	55	15 to 20	5 to 10
5. Left brachial artery		25.85	71.6	90	75

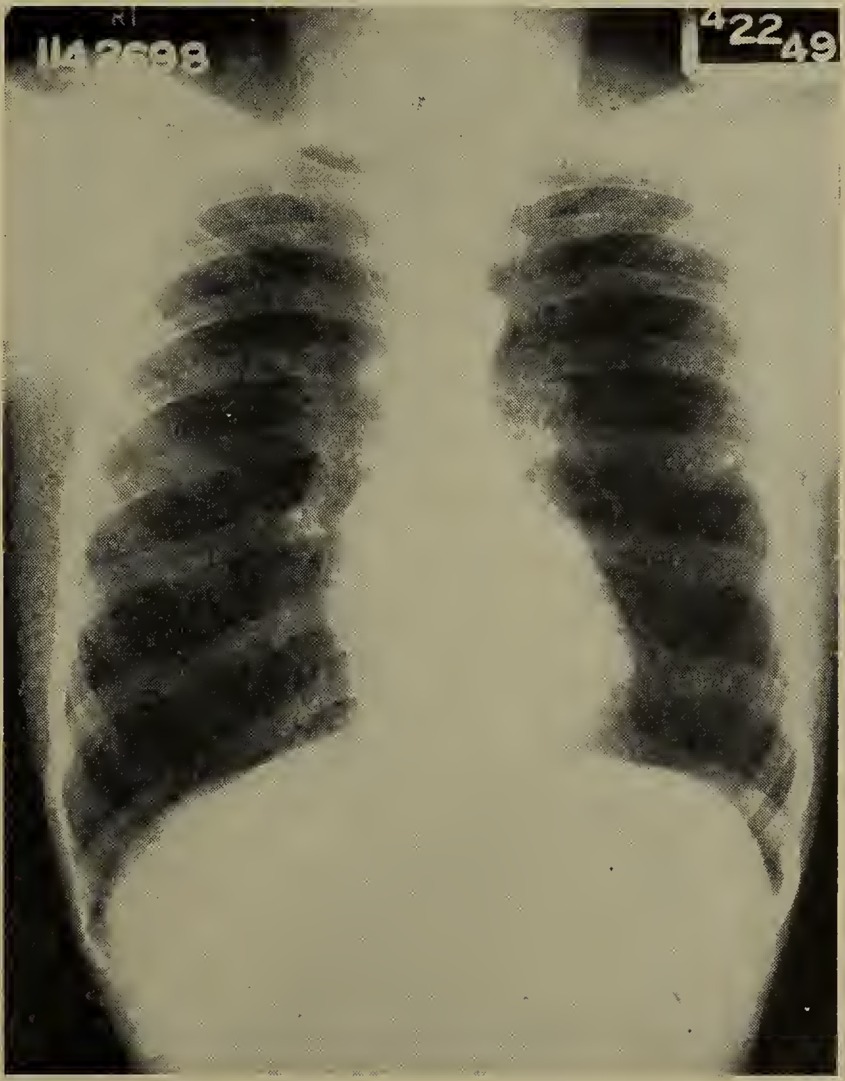


Figure 6, *A*

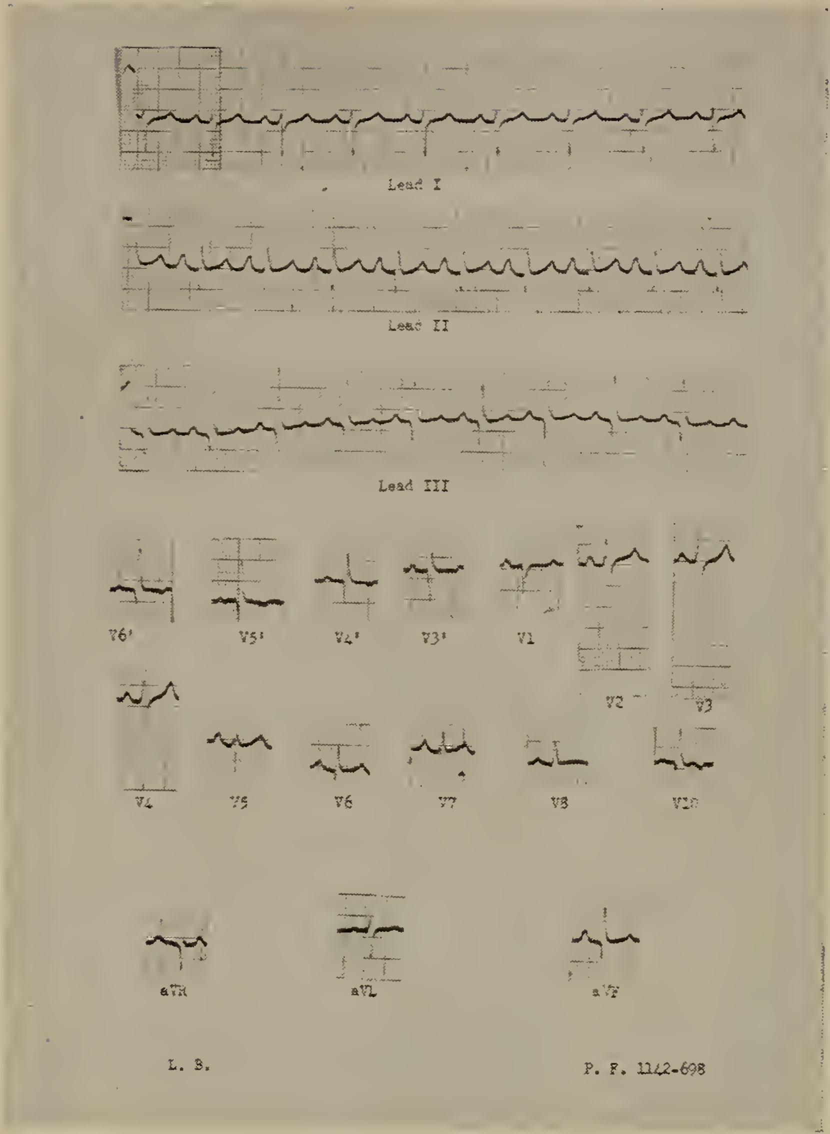


Figure 6, *B*

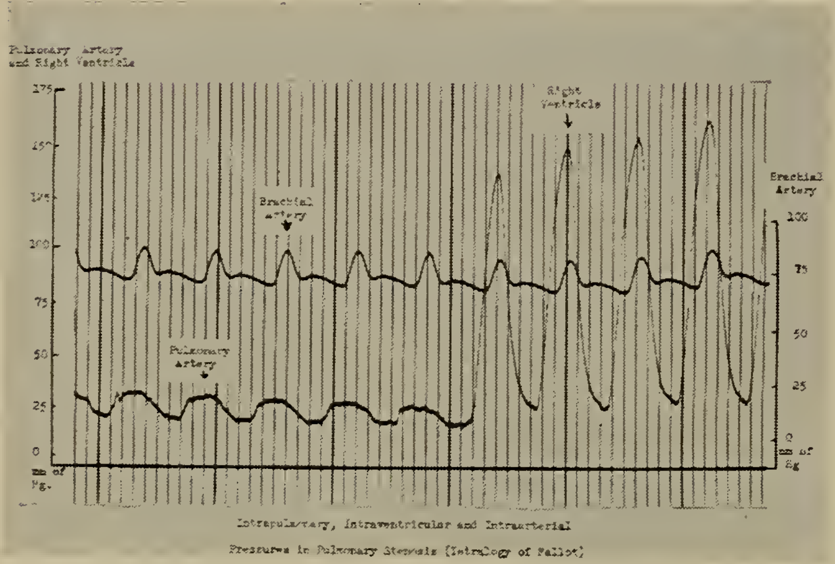


Figure 6, *C*

recordings from the catheter and an intra-arterial needle. The pronounced rise in pressure (Figure 6, *C*) as the catheter was withdrawn from the pulmonary artery into the right ventricle was objective proof of the presence of pulmonary stenosis. The rise of oxygen high in the right ventricle was possible evidence of a high interventricular septal defect. The very high right ventricular systolic pressure suggested overriding of the aorta and implied that the predominant shunt was from right to left. The diagnosis arrived at was that of tetralogy of Fallot, and a Blalock-Taussig operation was advised.

2. *Interatrial Septal Defect Plus Pulmonary Stenosis*

In the differential diagnosis of cyanotic congenital heart disease, pulmonary stenosis plus interatrial septal defect holds an important place. Operative results in this condition have been equivocal in spite of the presence of pulmonary stenosis and pronounced subnormality of oxygen content in arterial blood. To demonstrate the interatrial septal defect, the oxygen content of superior and inferior caval blood is a matter of great importance. The dynamics of the interatrial defect include shunts from right to left and from left to right. Ideally, the catheter should be passed through the interatrial defect into the left atrium.

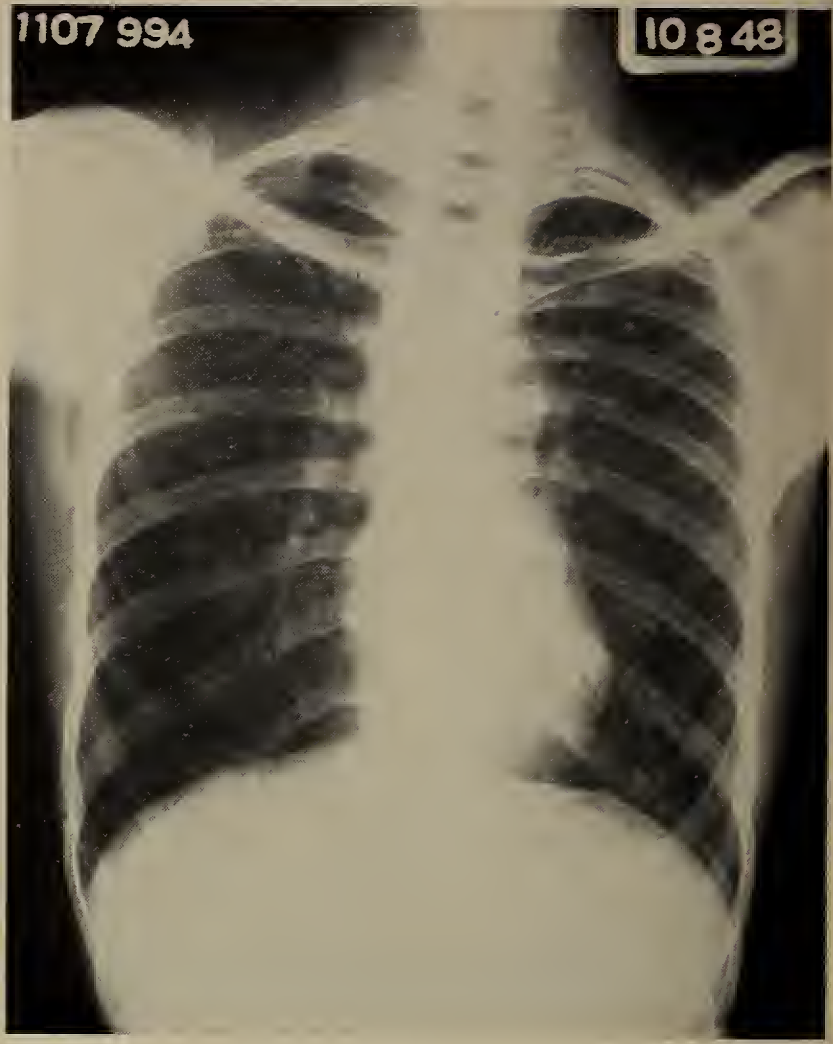


Figure 7, *A*

Case 6: A 23-year-old white male, cyanotic since birth, who complained of dyspnea and increase of cyanosis on exertion, was admitted for cardiac catheterization. He had frequently assumed a "squatting" position in the past. Growth and development had been somewhat impaired.

Upon physical examination, clubbing of fingers and toes was noted. The pulse rate was 66 per minute. The blood pressure was 95 mm. of mercury systolic and 70 mm. diastolic. The lungs were clear. The heart was not enlarged. There was a systolic thrill at the second and third interspaces to the left of the sternum. A grade IV systolic murmur was present at the second, third and fourth intercostal spaces to the left of the sternum and was transmitted into the neck.

An orthocardiogram showed some decrease in the vascular markings in the periphery of the lung fields (Figure 7, *A*). The heart was small and there was no concavity in the region of the pulmonary arc. In the left oblique, the right ventricle appeared to make up at least two-thirds of the cardiac silhouette.

An electrocardiogram gave evidence of right ventricular hypertrophy (Figure 7, *B*).

The hemoglobin content of the blood was 27.5 gm. per 100 cc. The results of cardiac catheterization are recorded in Table 6.

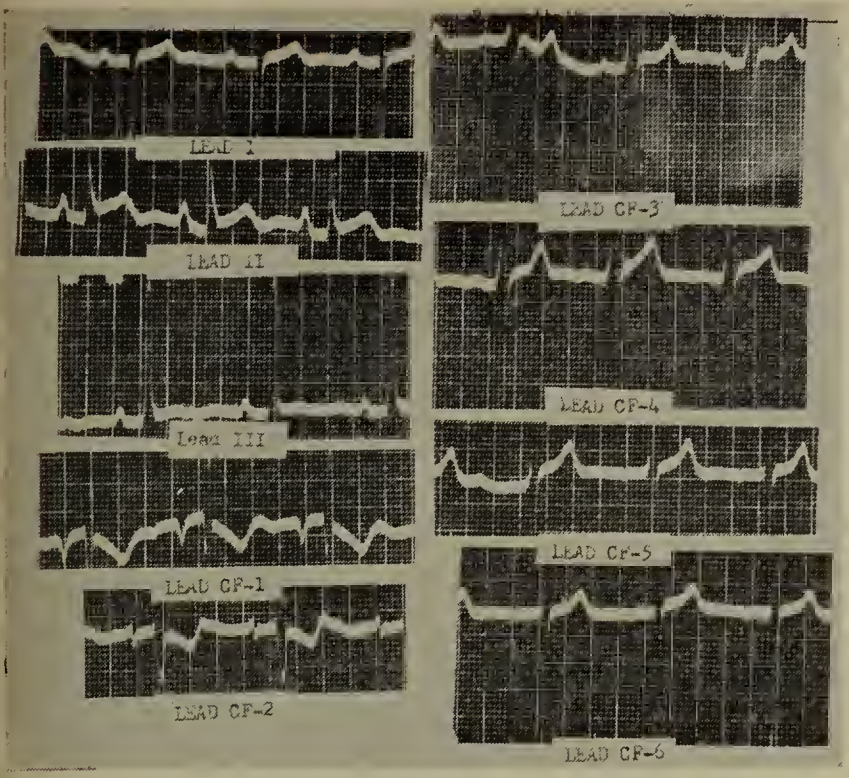


Figure 7, *B*

TABLE 6.—*Pulmonary Stenosis with Either an Interatrial Septal Defect or Transposed Pulmonary Veins*

Station	Oxygen Content (Vols. %)	Oxygen Saturation (Per Cent)	Mean Pressure (mm. of Mercury)
1. Right pulmonary artery	21.7	58.5	2 - 3
2. Right ventricle	22.1	59.6	39 - 61
3. Right atrium	22.1	59.6	1 - 2
4. Superior vena cava	18.5	50.0	0
5. Femoral artery	25	63.8	—

Note: With hemoglobin content at 27.5 gm. per 100 cc., 37.04 volumes % of oxygen would be needed for 100% saturation.

The oxygen content of the right atrium was 3.6 volumes per cent higher than that of the superior vena cava, representing either interatrial septal defect or transposed pulmonary veins. Also, the pressure, which was elevated in the right ventricle (39 to 61 mm. of mercury), dropped to 3 to 4 mm. in the pulmonary artery. From these data, the diagnosis of pulmonary stenosis was proven.

3. *Tetralogy of Eisenmenger*

The main diagnostic differential from tetralogy of Fallot is the tetralogy of Eisenmenger in which is found (1) a high interventricular septal defect, (2) right ventricular hypertrophy, (3) dextroposition of the aorta and (4) a *normal* or *dilated* pulmonary artery. Cyanosis usually does not appear until about the age of puberty.

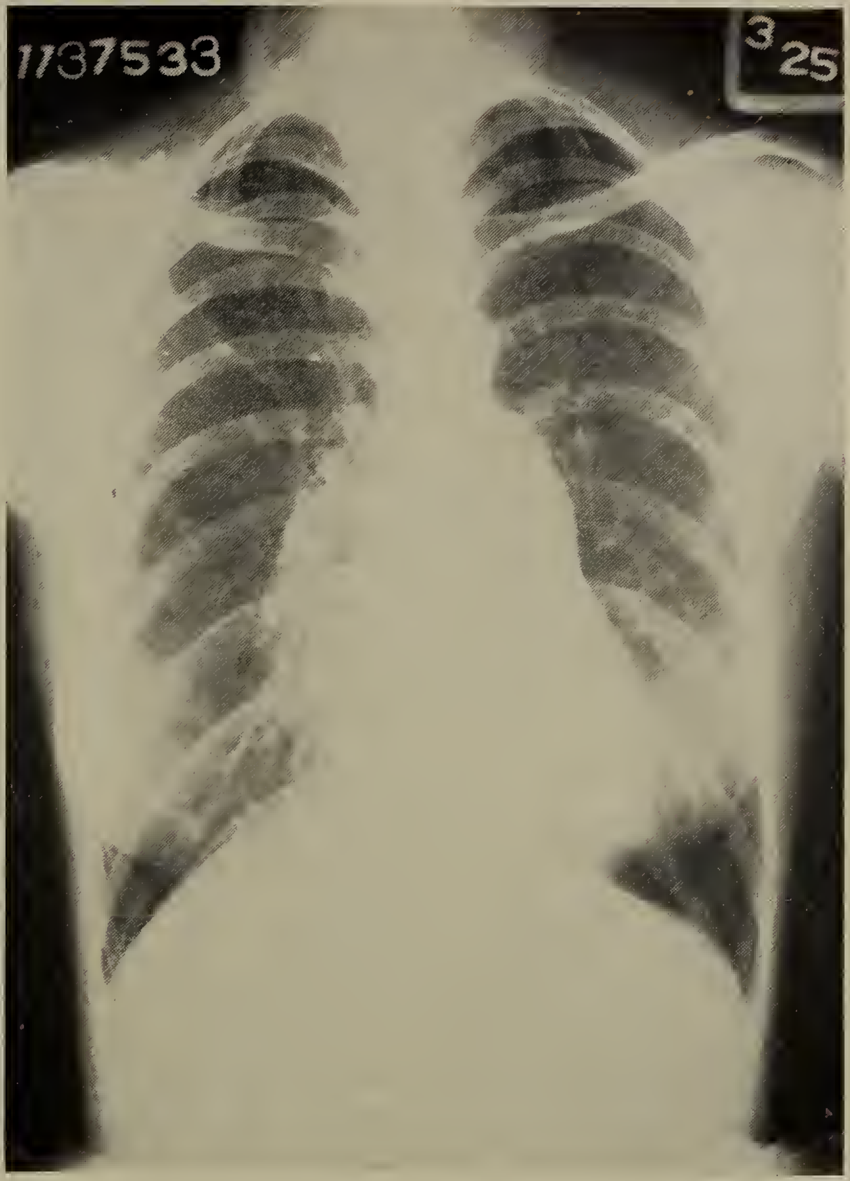


Figure 8, *A*

In the complex of Eisenmenger, the following determinations should pertain: (1) identical and simultaneous systolic pressure in pulmonary artery and right ventricle (both elevated above the normal, usually by a considerable amount). Both should be identical, or very nearly identical with that of aortic systolic pressure. (2) Right ventricular hypertrophy is self-evident in the above. (3) The interventricular septal defect is more often evident than in the tetralogy of Fallot, and thus, right ventricular oxygen content tends to be higher than right atrial oxygen content. (4) Finally, although there is a fall of arterial oxygen saturation with exercise as in the tetralogy of Fallot, the oxygen consumed per liter of ventilation rises.

CASE 7: A 29-year-old white female, cyanotic since age 13, was admitted for cardiac catheterization. The cyanosis had persisted since onset, and clubbing of the fingers and toes had developed. Dyspnea occurred only on severe exertion.

Upon physical examination, cyanosis of the skin and mucous membranes was noted. Clubbing of fingers and toes was present. The temperature was 99° F., the pulse rate was 84 per minute, and the respiratory rate was 18 per minute. The blood pressure was 100 mm. of mercury systolic and 78 mm. diastolic. The lungs were clear. The heart was not enlarged on percussion. The point of maximum intensity was in the fifth intercostal space at the midclavicular line. P_2 was louder than A_2. There was a grade II systolic murmur at the base, best heard over the pulmonic area, and transmitted into the neck and toward the apex.

An orthocardiogram showed increased pulmonary markings with pulsating pulmonary arteries. Grade II right ventricular enlargement was present (Figure 8, *A*). An electrocardiogram gave evidence of right ventricular hypertrophy (Figure 8, *B*). Hemoglobin content of the blood was 19.5 gm. per 100 cc. Leukocytes numbered 7,700. The arm-to-tongue circulation time (dehydrocholic acid) was 12 seconds, and the arm-to-lung circulation time (ether) was 8 seconds.

The results of cardiac catheterization are recorded in Table 7, and the pressure readings are recorded in Figure 8, *C*.

The pressure in the main pulmonary artery was 102 mm. of mercury systolic and 50 mm. diastolic; pressure in the right ventricle was 99 mm. systolic and 2 mm. diastolic. The following measurements were pertinent and typical: (1) The right ventricular systolic pressure, and the pulmonary artery systolic pressure were considerably elevated and similar. (2) The pressures in both approximated the brachial artery systolic pressure. (3) The high oxygen content of pulmonary artery was presumably caused by a high interventricular septal defect. The findings were typical of Eisenmenger's complex.

4. *Rudimentary Right Ventricle and Transposed Pulmonary Veins*

In cyanotic congenital heart disease, right axis deviation is definitely more common than left axis deviation. The finding of left axis deviation usually suggests a small or rudimentary right ventricle, often with the added feature of tricuspid atresia. (Left axis deviation may also occur in single ventricle or with a tetralogy of Fallot with dextrocardia.) The following case illustrates these features and, in addition, the presence of pulmonary veins entering the right atrium.

TABLE 7.—*Tetralogy of Eisenmenger*

Station	Oxygen Content (Vols. %)	Oxygen Saturation (Per Cent)	Pressure Syst./Diast. (mm. Hg.)	Pressure Mean
1. Right pulmonary artery	17.8	76.5	115/50	78–82
2. Main pulmonary artery	17.6	70.6	102/50	78–80
3. Right ventricle	16.0	60.6	99/2	43–60
4. Right atrium	15.5	58.8	6/2	2–4
5. Superior vena cava	14.7	55.7		
6. Right brachial artery	21.8	82.7	115/75	95

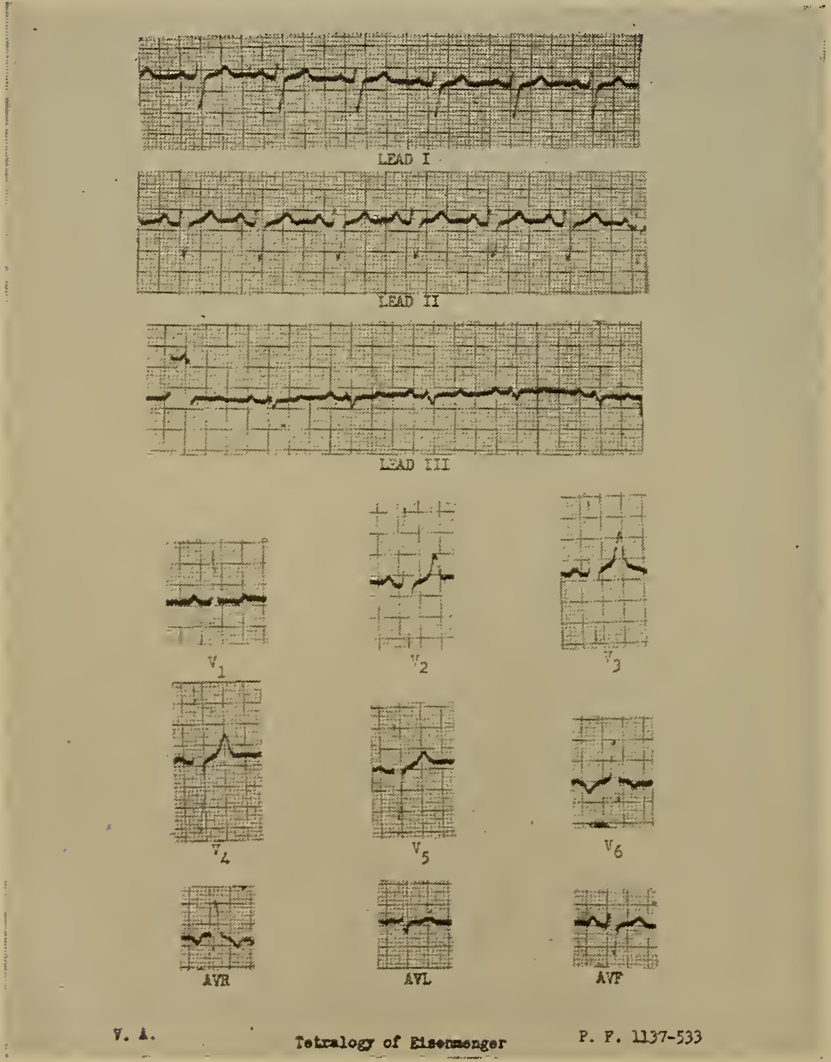
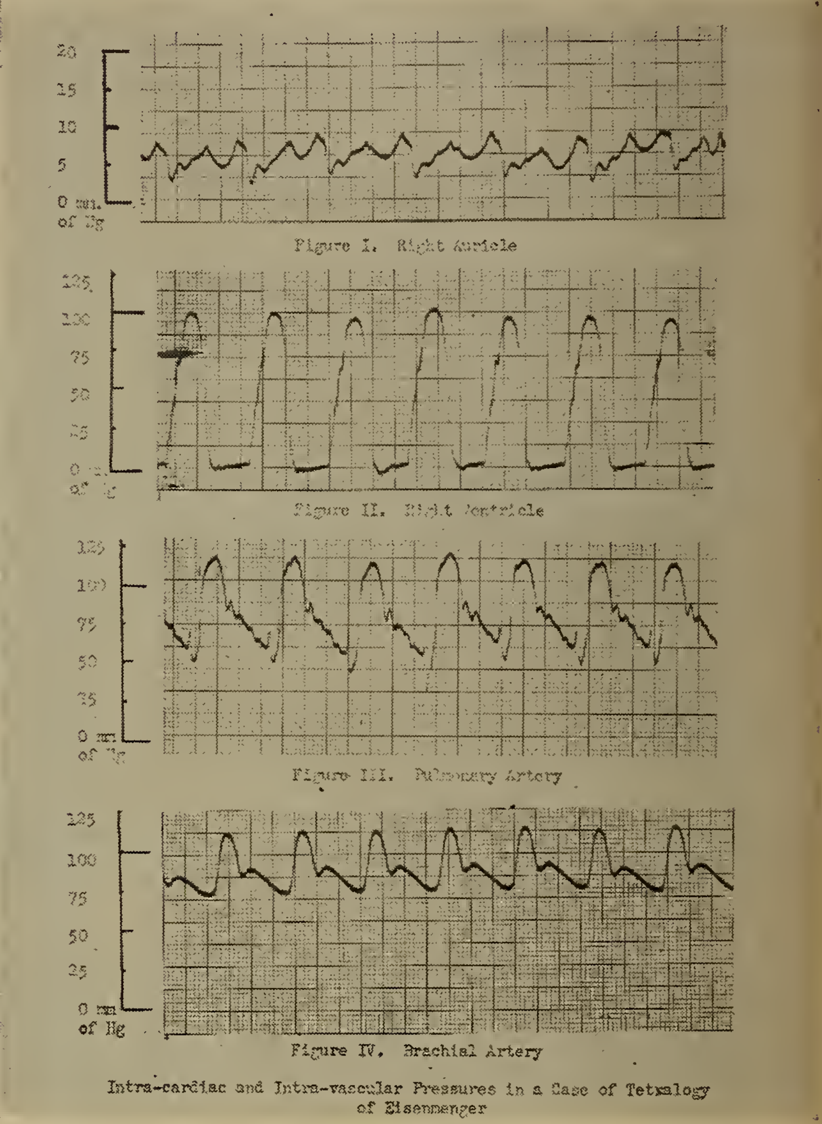


Figure 8, *B*



Intra-cardiac and Intra-vascular Pressures in a Case of Tetralogy of Eisenmenger

Figure 8, *C*

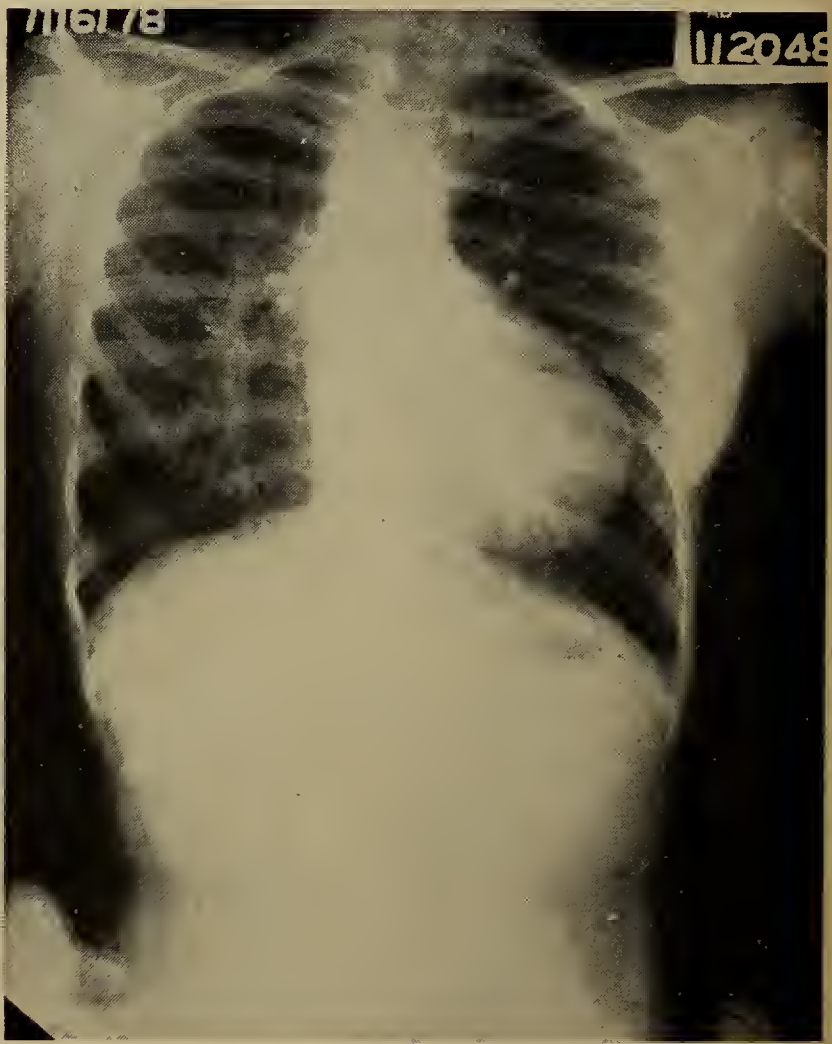


Figure 9, *A*

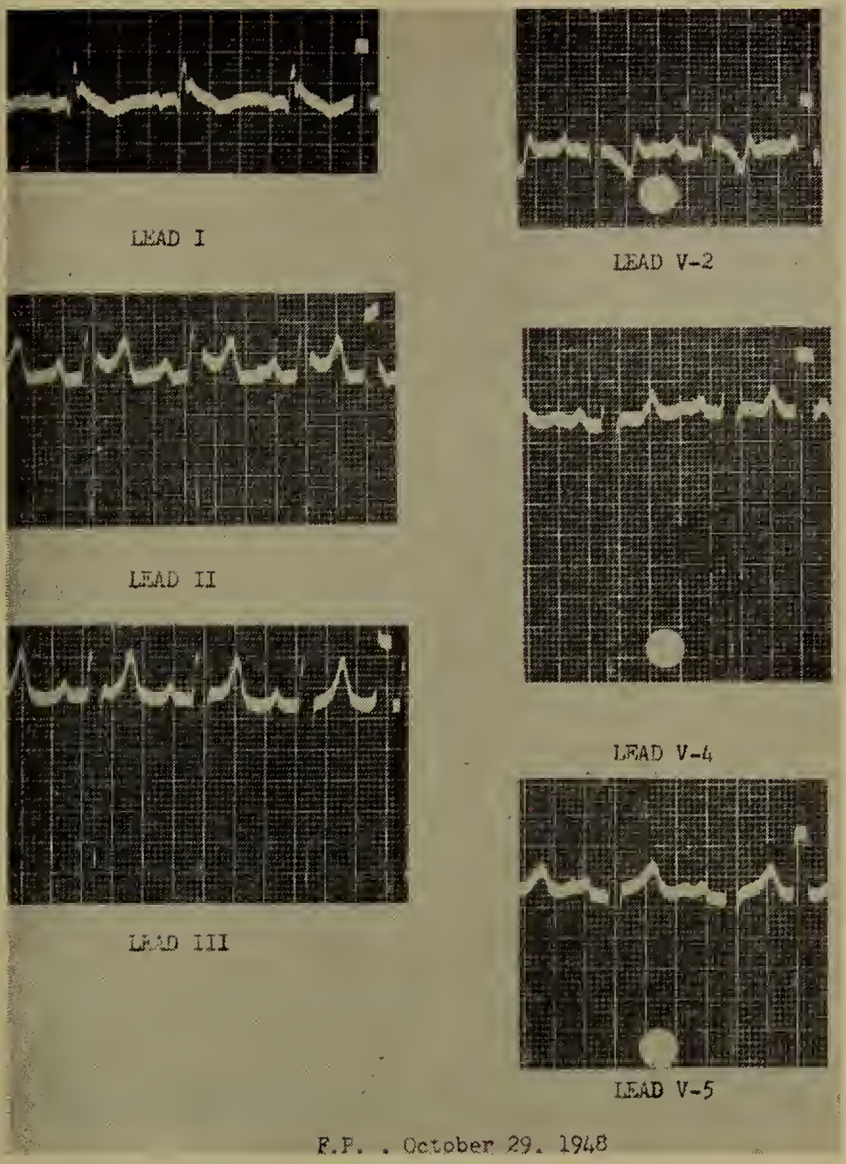


Figure 9, *B*

Case 8: A 13-year-old white female, a "blue baby," and cyanotic since birth, was admitted to the Los Angeles County Hospital on November 20, 1948, for cardiac catheterization. Growth and development had been normal, but the exercise tolerance had been low as long as the patient could remember.

The patient was well developed. Cyanosis and clubbing of fingers and toes were present. The blood pressure was 94 mm. of mercury systolic and 88 mm. diastolic. The lungs were clear. Upon examination of the heart the point of maximum intensity was located in the fifth intercostal space at the midclavicular line. P_2 was accentuated and greater than A_2. There was a grade III systolic murmur in the fifth interspace just inside the midclavicular line.

An orthocardiogram (Figure 9, *A*) showed a boot-shaped left ventricle in the posterior-anterior view. One plus enlargement was present. In the left oblique view there was a straightening of the normal contour of the right ventricle which suggested a small or non-functioning right ventricle.

An electrocardiogram gave evidence of pronounced left axis deviation. The QRS interval was prolonged (Figure 9, *B*).

Table 8.—*Rudimentary Right Ventricle with Transposition of the Pulmonary Veins*

Station	Oxygen Content (Vols. %)	Oxygen Saturation (Per Cent)	Mean Pressure (mm. of Mercury)
1. Right pulmonary vein	24.5	80.0	9
2. Coronary sinus	4.45	14.5	40
3. Right atrium	16.8	53.4	18
4. Superior vena cava	14.7	46.8	9
5. Aorta	20.4	65.3	40

The results of cardiac catheterization are recorded in Table 8. Prior to catheterization, the main features of this case were: (1) cyanotic heart disease with left axis deviation and (2) an orthocardiogram showing a small or rudimentary right ventricle.

During the catheterization, the catheter was first observed to pass directly from the superior vena cava and the right atrium into the right pulmonary vein, from which oxygenated blood was obtained. Later, the catheter was passed into the aorta (presumably from right ventricle, through interventricular septal defect, into left ventricle) and appeared in the descending aorta at about the level of the second lumbar vertebra.

Reviewing all the findings, the following defects were established: (1) transposed pulmonary veins (by the presence of completely oxygenated blood in a vein emptying into the superior vena cava); (2) rudimentary or nonfunctioning right ventricle (straight anterior margin of the heart in the left oblique position by x-ray and the extreme left axis deviation in the electrocardiogram. It is presumed (but not proven) that interatrial septal defect, with or without interventricular septal defect, completes the picture in this malformation.

For valuable assistance in the work here described, the authors wish to express appreciation to Drs. Marvin Darsie, John Dillon, Ray Carter, Howard G. Roberts, Pat Meehan, Jack Sheinkopf, Willard Zinn, and Harold Miller, and to Miss Mary Mayo, Miss Grace Gallagher, R.N., Miss Mary Davis, Mr. Paul Munday and Mr. Andrew Farr.

REFERENCES

1. Bing, R. J., Handelsman, J. C., and Campbell, J. A.: Physiologic diagnostic tests in congenital heart disease, Modern Concepts Cardiovas. Disease, 17: [n.p.], March 1948.

2. Cournand, A., Baldwin, J. S., and Himmelstein, A.: Cardiac Catheterization in Congenital Heart Disease. Commonwealth Fund. New York City. 1949.

3. Cournand, A., and Ranges, H. A.: Catheterization of right auricle in man, Proc. Soc. Exp. Biol. and Med., 46:462, March 1941.

4. Dexter, L., Haynes, F., Burwell, C., Eppinger, E., Sagerson, R., and Evans, J.: Studies of congenital heart disease. II. The pressure and oxygen content of blood in the right auricle, right ventricle and pulmonary artery in control patients, with observations on the oxygen saturation and source of pulmonary "capillary" blood, J. Clin. Investigation, 26:554, 1947.

5. Vandam, L. V., Bing, R. J., and Gray, F. D., Jr.: Physiological studies in congenital heart disease. IV. Measurements of the circulation in five selected cases, Bull. J. Hopkins Hosp., 81:192, Sept. 1947.

Habitual Abortion

Ralph C. Benson, M.D., *San Francisco*

SUMMARY

Habitual abortion should be defined as the spontaneous sequential loss of three or more pre-viable pregnancies.

The incidence and etiology of spontaneous single and repeated, sequential abortion are discussed.

The theoretical role of the various hormones in the treatment of abortion is examined.

The modes of therapy now in effect are reviewed and their probable value estimated.

Preconceptual therapy of the wife and husband for the successful salvage of a viable infant following previous sequential abortion is recommended.

Logical postconceptual and emergency therapy is outlined for the patient who is an habitual aborter.

A critical view of previous and present methods of study and treatment of habitual abortion is expressed.

HABITUAL abortion is a challenge to the obstetrician because of the complexity of causes and the low salvage achieved thus far with any or all of the available therapeutic regimens. Undue pessimism has characterized the attitude of both the layman and the physician regarding the outcome of subsequent pregnancies in patients who have had repeated abortion. On the other hand, there has been unjustified optimism regarding hormone therapy. These conflicting opinions have confused obstetrical thought. This review is intended to define habitual abortion, to summarize current thought concerning some of the factors involved in repetitious abortion, and to evaluate the therapy of this malady.

Habitual abortion has been variously defined. The sequential loss of three or more pre-viable pregnancies seems to be the most acceptable definition.[6, 16, 17] An elaboration of this definition suggests that patients who have had three or more consecutive abortions, beginning with the first pregnancy, be considered as primary habitual aborters. The term "secondary habitual abortion" would then be applied to those patients who have had three or more consecutive abortions following delivery of one or more premature or full-term infants.[13] However, not all observers are agreed upon these interpretations. Some clinicians have professed to consider the term "habitual aborter" applicable to women who have had more than one abortion,[10] two or more abortions,[9] abortions occurring repeatedly,[26] or, abortions in a number of successive pregnancies.[25] Chronic abortion has also been a term used to indicate repeated, although not necessarily sequential, abortion.[23] Such a variety of definitions represents a multiplicity of impressions regarding the incidence of habitual abortion. Add to this situation the complexity of compound therapy and the subject of habitual abortion becomes completely chaotic. The satisfactory comparison of one series of sequential abortions with another is therefore almost impossible.

Another point of argument is: How small must an infant be to be considered non-viable and therefore its birth as abortive? The successful management of the premature infant has permitted the salvage of numerous very small infants during recent years. Most of the reports of salvage have come from the larger hospitals or medical centers. For example, Levine has reviewed the survival of 32 infants weighing between 501 and 1,000 gm. in recent years.[13] It may be that the classification of infants should be scaled below the usually accepted limit of 1,501 gm. as a minimal weight for a viable child. However, the survival of infants weighing less than 1,500 gm. is rare. For the time being, therefore, the original concept that infants below 1,500 gm. will probably not survive will be adhered to. This point of view applies in vital statistics and is generally retained in most articles on sequential abortion.

INCIDENCE OF SPONTANEOUS ABORTION

The incidence of spontaneous abortion in general is between 10 per cent and 20 per cent of all pregnancies.[9, 15, 27] Sequential or habitual abortion constitutes about 0.4 per cent of all pregnancies or 4 per cent of all spontaneous abortions.[6] The women in whom such abortions occur are not sterile in the true sense of the word, but since they cannot carry a fertilized ovum to maturity or viability, they have "pseudo-sterility."[22] Javert reported the incidence of primary habitual abortion as 0.3 per cent and of secondary habitual abortion as 0.2 per cent of all pregnancies.[13] Full term expectancy is probably somewhat better in the secondary group.

All spontaneous abortions occur because of (1) random or accidental factors which are usually not repetitious, and (2) recurrent or persistent factors. Random factors are unlikely to recur save by chance. Recurrent factors, on the other hand, are

---

From the Division of Obstetrics and Gynecology, University of California Medical School, San Francisco.

Presented at the Annual Obstetric-Pediatric Refresher Lecture Series, Western Oregon Cities, May 2-13, 1949. Lectureship sponsored by the Oregon State Medical Society and the Oregon State Board of Health.

due to inherent conditions which are inimical to the growth and maturity of the ovum in each successive pregnancy. If 10 per cent is accepted as an average figure for the incidence of spontaneous abortion in all pregnancies, it has been calculated that 0.4 per cent of these terminate because of recurrent factors. Malpas,[16, 17] and more recently Eastman,[6] have calculated the incidence of abortion factors. They have found that a definite spontaneous cure rate is to be expected despite one, two or more spontaneous abortions.

Not all embryologists agree upon 10 per cent as the correct incidence of spontaneous abortion. Certain investigators have placed the figure much higher—some to 20 per cent.[10, 27] For this reason, the author has calculated (Table 1) the spontaneous cure rate following repeated abortion, after the method of Eastman,[6] on the basis of 10 per cent *and* 20 per cent abortion incidence. It is apparent that after three or more abortions, the percentage of spontaneous cure is somewhat higher with the 20 per cent figure. (Actually, the true figure may be somewhere between 10 per cent and 20 per cent.)

TABLE 1.—*Chances of Repeat Abortion in Successive Pregnancies if One Assumes a 10 Per Cent vs. 20 Per Cent Incidence*

Previous Abortions	Per Cent Will Abort	Spontaneous Cure Rate	
		20% Incidence	10% (Eastman)
0	20.0	......	......
1	22.4	77.8%	86.8%
2	33.6	66.4	63.1
3	68.3	31.7	16.4
4	88.2	11.8	0.1

It will be concluded, then, that the physician is justified in assuming a fairly optimistic prognosis for a third pregnancy in women who have had two or more spontaneous abortions. It is apparent that previous abortion is not a grave damper on expectation of successful pregnancy until after three or more sequential abortions. For the same reasons the doctor should be extremely critical of the value of medication given a patient in a third pregnancy after two previous successive abortions, because two out of three will go to viability without any treatment whatsoever. This view is substantiated by the data in Table 1. After four or more spontaneous abortions, the spontaneous cure rate is very low. Therefore, the results of all therapy in habitual abortion should be cautiously appraised because of this statistically significant cure rate. In women who have lost one previous non-viable pregnancy, therapy cannot be considered as having been of value unless the cure rate with therapy is at least 80 per cent plus. After two previous abortions, the cure rate with therapy would have to be greater than 65 per cent to indicate any benefit from treatment. In short, if it can be demonstrated that hormone or other therapy has raised the cure rate significantly above the calculated spontaneous cure rate, then such a therapeutic regimen must have distinct merit and should be recommended. With a very critical attitude applied toward the various routines which have been recommended in the treatment of habitual abortion, data on almost every series thus far reported will show no improvement over the expectancy for spontaneous cure.

PATHOGENESIS

A great deal has been written on the pathogenesis of abortion.[27] Many etiological factors, including some that are little understood, have been described. Meeker[18] has presented one correlation in outline form. Although random and recurrent causes are not specifically separated, his summary can be recommended.

PATHOGENESIS OF ABORTION (Meeker)[18]

1. *Death of the Ovum:*
   a. Hereditary Faults:
      1. Lethal and sublethal factors in the germ plasm
      2. Low vitality due to infertility of parents
   b. Environmental Faults:
      1. Malnutrition from defective implantation
      2. Acute and chronic maternal disease
2. *Separation of the Ovum:*
   a. Abnormalities of the decidua:
      1. Insufficient endocrine stimulus
      2. Insufficient endometrial response
3. *Expulsive Uterine Contractions:*
   a. Factors inciting contractions:
      1. Mechanical hindrances to enlargement of the uterus
      2. Excessive violence
   b. Excessive uterine irritability.

A somewhat different approach to the problem is that formulated by Hertig[9] in his evaluation of the causes of abortion based upon a study of lesions of the zygote as well as various maternal factors.

PATHOGENESIS OF ABORTION (Hertig)[9]

Ovular Factors:	Per Cent
Hydatidiform degeneration, various degrees	33.0
Abnormalities of the placenta, other	9.6
Abnormalities of the embryo, chiefly neurogenic	3.2
Maternal Factors:	
Uterine abnormalities	6.4
Low implantation of the placenta	5.6
Febrile or inflammatory maternal disease	2.0
Miscellaneous	1.2
Undetermined	38.0

These stated abnormalities are the most easily recognized. However, it is suggested that if the entire delineation were known, degeneration of the ovum itself would not only loom large but would perhaps be even more important than chorionic lesions.[28]

So far as recurrent factors in habitual abortion are concerned, the most likely causes would include persistent, chronic or uncorrected faults of the germ plasm (ova *and* sperm); abnormalities of the female reproductive tract; maternal chronic infections and metabolic diseases; female dietary and endocrine deficiencies.

In general, it would seem that although the number of abortions due to maternal factors (both random and recurrent) is small, these causes are very important. The correction of such abnormalities can be expected to be most fruitful in the salvage of subsequent pregnancies. So far as ovular factors are concerned, there is little that can be done at present because of the complexity of the problem.

A great deal is heard about the value of hormone therapy in habitual abortion. However, upon close analysis, it becomes apparent that there has been much loose talk and wishful thinking. At the present stage of knowledge, hormones can be expected to give only limited aid. Hormone supplements may improve environmental faults by improving the circulation of the uterus, ovary or endometrium.[2] They might be expected to offer additional endocrine stimulus to a lagging endometrium or ovary.[5] In addition, it seems possible that the steroid hormones may reduce excessive uterine contractility where a threatened abortion is in progress.[20]

Embryologists have for years insisted that the majority of abortions occur because of a defective ovum or placenta.[9, 15, 27] If this be the case in humans, then the hormones will be largely ineffectual. In the case of hydatidiform mole, for example, it is inconceivable that any quantity of stilbestrol could alter or improve the hydropic degeneration of the villi. When the situation has progressed to this point —and many embryos are thus blighted even in the first few weeks after nidation—it would seem that, "All the King's horses and all the King's men can't put Humpty Dumpty together again."

THE ROLE OF HORMONES IN ABORTION

A brief review of the role of hormones in abortion may aid in evaluation of what these endocrine products may be expected to accomplish in a positive or negative direction.

The Gonadotropins.

The anterior hypophysis produces pituitary gonadotropins which stimulate the corpus luteum to produce progesterone and estrogen. Potent pituitary gonadotropins are neither well evaluated nor available at this time for therapy in habitual abortion.

The chorioplacental system takes over the major production of progesterone and estrogen after the second month of pregnancy, and certain abortions occur during this critical transition period. The chorionic ectoderm produces chorionic gonadotropin as well. It is thought that the extended function of the corpus luteum in the event of pregnancy is due to the stimulus of chorionic gonadotropin. The chorionic gonadotropin differs, however, from pituitary gonadotropin and although the pituitary hormone may stimulate the formation of progesterone-estrogen, the chorionic hormone will not do so to any extent. Moreover, chorionic gonadotropin is rarely low save in a grossly deficient pregnancy. Even if it were of value in the treatment of abortion, therapeutic administration of this substance would probably require enormous quantities.[26]

The Natural Estrogens and Progesterone.

Natural estrogen is thought to prime the uterus for the inhibiting action of progesterone. In addition, progesterone prevents the excessive destruction of estrogen and is thought to aid in the conversion-degradation of estrone to estriol.[4] A balance between estrogen and progesterone is required for the delicate adjustment necessary for uterine quiescence.[23]

Prior to labor or abortion, a lowering or sudden fall in pregnandiol and/or estrogen occurs.[2, 3, 5] The administration of progesterone to bolster this progesterone deficiency has been advocated.[21] However, the administration of progesterone alone does not elevate the content of estrogen in the blood. Moreover, it is suspected that large doses of progesterone may actually operate to reduce endogenous progesterone.[7]

The Synthetic Estrogens.

It is claimed that small amounts of stilbestrol cause increased secretion of progesterone and natural estrogen, probably by the placental syncytium.[21] This is apparently the result of increased utilization or excretion of chorionic gonadotropin. Stilbestrol is used in the treatment of abortion, not as an estrogen but as a stimulant to the production of progesterone and natural estrogen.[21]

Thyroid Hormones.

Low thyroid function is known to result in pituitary failure and also in ovarian deficiency. Although the cause and effect are difficult to demonstrate in abortion, subclinical hypothyroidism is more common than is appreciated and administration of thyroid extract is therefore often valuable.[5, 19]

It is likely that the alert obstetrician can modify certain factors in either isolated or habitual abortion. These factors would be, in the great majority of cases, maternal faults. If, as Hertig[9] has noted, these constitute only 15 per cent of the observed factors operative in abortion, therapeutic successes will be very limited.

TREATMENT

Despite these conclusions, physicians should not become too pessimistic, for there is logic in certain routines and medications which have been of value over the years. The author believes in treating the patient who is a sequential or habitual aborter. The medical management of such patients should include three plans: (1) preconceptual treatment, if possible; (2) postconceptual treatment; and, (3) emergency treatment.[21] Therapy may be either liberal or conservative according to the views of the individual physician. However, eagerness, gullibility, a "give-it-anyhow-for-psychic-effect" attitude, as well as a reluctance to abandon one therapeutic weapon when another takes its place, have led to promiscuous and irrational hormone therapy.[10]

Prophylactic therapy is of obvious value. The patient and her husband should be investigated and treated preconceptually whenever possible.[6, 10, 25] Fundamentally, general hygiene and other methods calculated to put both husband and wife in the best physical and mental state are indicated. The basal metabolic rate should always be determined, for thyroid therapy may be of great value even where minor degrees of hypothyroidism exist. Cervicitis and other infections should be eradicated, pelvic tumors should be eliminated, and retroversion of the uterus may require correction—before the next pregnancy. A complete semen evaluation, as is done in sterility study, is valuable, and suitable treatment should be administered if the specimen is consistently deficient. Supportive or supplementary hormone therapy may be initiated very early in pregnancy, when, for example, the basal body temperature chart or Friedman test confirms the presence of pregnancy. Limitation of activity, avoidance of douches and intercourse are advised. If abortion threatens, bed rest, mild sedation, suspension of coitus, and avoidance of purges or excitement are helpful. At least one authority insists that such a regimen is of as much value in therapy as are the much-discussed hormones.[10]

Regarding a specific program of therapy, it is possible to outline the medications and routines thus:

1. Agents and methods which have a rationale and are of distinct value when indicated in prophylactic therapy of habitual abortion. They may include:
   a. Reduction of pathological factors in husband and wife.
   b. All essential vitamins in optimum amounts, preferably in the diet.
   c. A high protein diet.
2. Agents which have possible rationale in habitual abortion:
   a. Stilbestrol or estrogen-progesterone therapy.
   b. Progesterone or estrogen alone.
3. Agents for which there is evidence suggestive of value in habitual abortion:
   a. Vitamin C, E (?), K.
   b. Mixed gonadotropins.

The author does not believe that vitamin E can be recommended as a routine therapeutic agent in the treatment of habitual abortion. According to the Council on Therapy of the American Medical Association, (1) there is lack of convincing evidence of its value in habitual or other abortion, and (2) variation of dosage is wide in patients reportedly benefited by the preparation.[9]

During recent years, two significant hormone regimens have been advanced in the intercurrent treatment of habitual abortion. One is the stilbestrol regimen as outlined by Smith and Smith.[24] This program has been evaluated in a small but carefully selected series of cases. Rather convincing evidence for its successful use in repeated abortion has been presented. This routine is as follows:

> Stilbestrol, 5.0 mg. daily, is started in the sixth or seventh week of pregnancy. The daily dose is increased 5.0 mg. every two weeks. After 16th week it is increased by a daily dose of 5.0 mg. per week. Stilbestrol is discontinued at 35th week of pregnancy.

Unfortunately, the cost of stilbestrol to a private patient for the course recommended is about 45 dollars at this time.

Vaux and Rakoff[29] have suggested a combination of progesterone and natural estrogen in the therapy of habitual abortion. A statistical appraisal of their results reveals a significant increase in the fetal salvage following the use of this medication. The suggested regimen follows:

> Progesterone, 10 mg., and alpha-estradiol benzoate, 1.66 mg., given together intramuscularly every two or three days. This treatment is begun as early in pregnancy as possible and is carried to the period of viability or later.

This treatment also is expensive and entails the hypodermic administration of the required medication.

An emergency routine for threatened abortion, as outlined by Karnaky,[14] also has advocates:

> Initial dose of 100-250 mg. of stilbestrol intramuscularly (25 mg. into the cervix). Then, 25 mg. orally, every 15 minutes until bleeding and/or pain cease. Daily doses thereafter of 10-100 mg., tapering off if no bleeding or pain recurs. Daily dose is increased sharply if bleeding or pain recurs.

Certain patients may be expected to retain the fetus and carry it successfully with this regimen, particularly where uterine hyperirritability is apparent. However, vaginal smear studies of patients presenting signs and symptoms of an accident of early pregnancy indicate that with the onset of uterine bleeding, the pregnancy often has actually terminated although the products of conception may still be retained.[1] Nevertheless, in an effort to do everything possible to salvage a threatened pregnancy, the use of such a routine is justified.

REFERENCES

1. Benson, R. C., Traut, H. F.: The vaginal smear as a diagnostic and prognostic aid in abortion, J. Clin. Endocrinol. (In Press.)

2. Browne, J. S. L., Henry, J. S., Venning, E. H.: Significance of endocrine assays in threatened and habitual abortion, Am. J. Obstet. and Gynec., 38:927, Dec. 1939.

3. Cohen, S. L., Marrian, G. F., Watson, M. C.: Excretion of estrin during pregnancy, Lancet, 1:675, March 1935.

4. Corner, G. W.: Glandular Physiology and Therapy, A.M.A., Chicago, 1942.

5. Delf, E., Jones, G. L. S.: Normal and Pathological Physiology in Pregnancy, Williams and Wilkins, Baltimore, 1948.

6. Eastman, N. J.: Editorial comment on habitual abortion, Obstet. and Gynec. Survey, 2:17, Feb. 1947.

7. Hamblen, E. C.: Endocrinology of Women, Springfield, Ill., Chas. Thomas, 1945.

8. Hamblen, E. C.: Some clinical observations on endocrinology of abortion, Am. J. Obstet. and Gynec., 41:664, April 1941.

9. Hertig, A., Livingstone, R. G.: Medical progress; spontaneous, threatened and habitual abortion; their prognosis and treatment, New England J. Med., 230:797, June 1944.

10. Hoffman, J. M.: Symposium on recent advances in gynecology and obstetrics; uses and abuses of endocrine therapy, M. Clin. North America, 29:1396, Nov. 1945.

11. Hunt, A. B.: Habitual abortion, M. Clin. North America, 30:965, July 1946.

12. Javert, C. T., Stander, H. J.: Plasma vitamin C and prothrombin concentration in pregnancy and in threatened,

spontaneous and habitual abortion, Surg. Gynec. and Obstet., 76:115, Jan. 1943.

13. Javert, C. T., Finn, W. F., Stander, H. J.: Primary and secondary spontaneous habitual abortion, Am. J. Obstet. and Gynec., 57:878, May 1949.

14. Karnaky, K. J.: Use of stilbestrol for treatment of threatened and habitual abortion and premature labor; preliminary report, South. M. J., 35:838, Sept. 1942.

15. Mall, F. P.: On the frequency of localized anomalies in human embryos and infants at birth, Am. J. Anat., 22:838, July 1917.

16. Malpas, P.: A study of abortion sequences, J. Obstet. and Gynec. Brit. Emp., 45:932, Dec. 1938.

17. Malpas, P.: Categories of abortion and abortion-stillbirth sequences, J. Obstet. and Gynec. Brit. Emp., 49:65, Feb. 1942.

18. Meeker, S. R.: Working classification of causes of abortion, J.A.M.A., 123:680, Nov. 1943.

19. Pratt, J. P.: Ovarian therapy, Endocrinology, 16:45, Jan.-Feb. 1932.

20. Reynolds, S. R. M.: Physiology of the Uterus, Paul B. Hoeber, New York, 1939.

21. Rutherford, R. N.: Spontaneous and induced abortion; modern concepts of their significance, pathogenesis, diagnosis and treatment, West. J. Surg., 51:257, July 1943.

22. Sachs, E.: Therapeutic Problems of Today. Teva. Tit., Jerusalem, 1948.

23. Smith, O. W., Smith, G. V., Schiller, S.: Estrogen and progestin metabolism in pregnancy; spontaneous and induced labor, J. Clin. Endocrinol., 1:461, June 1941.

24. Smith, O. W., Smith, G. V., Hurwitz, D.: Increased excretion of pregnandiol in pregnancy from diethylstilbestrol with special reference to prevention of late pregnancy accidents, Am. J. Obstet. and Gynec., 51:411, March 1946.

25. Siegler, S. L.: Fertility in Women, J. B. Lippincott, Phila., 1945.

26. Stander, H. J.: Textbook of Obstetrics, D. Appleton-Century, New York, 1945.

27. Taussig, F. J.: Abortion, Spontaneous and Induced, C. V. Mosby, St. Louis, 1936.

28. Traut, H. F.: Personal communication.

29. Vaux, N. V., Rakoff, A. E.: Estrogen-progesterone therapy; new approach in treatment of habitual abortion; studies indicating its rationale in 24 treated cases, Am. J. Obstet. and Gynec., 50:353, Oct. 1945.

* * *

Skeletal Suspension in the Treatment of Decubiti

ALBERT G. CLARK, M.D., *San Francisco*

SUMMARY

In the usual sacral decubitus, pressure may be relieved by skeletal suspension from Kirschner wires placed in the ilian crests. Pressure sores over the scapulae and thoracic spine may be handled by placing Kirschner wires through the clavicles. Both of these methods lend themselves to the preoperative care of a patient being prepared for the plastic closure of a decubitus.

IN the handling of large numbers of war casualties, one troublesome problem was the large number of decubiti encountered. Primarily, these were found in patients with injury to the spinal cord, but they occurred also in patients with other severe injuries such as burns and abdominal and chest wounds. The decubiti encountered were not only large but multiple, involving in the same patient, the sacral and scapular areas, the anterior surfaces of both knees, both shins, both heels, both trochanteric and both iliac areas. Decubiti are, of course, much less frequently encountered in civilian practice, but they do occur in patients with severe burns, in paraplegics and in patients debilitated from any cause.

Extensive decubiti almost always produce toxemia and usually pronounced anemia along with a low leukocyte count and low hematocrit reading. Recently it has been shown that pronounced hypoproteinemia occurs as well. Mulholland,[4] who carefully checked the protein intake and output in some 35 patients, found that there was a negative nitrogen balance with a consistently low blood protein value in all of them. He found that intubation and forced feeding with a high protein diet were of more value than blood transfusions. In patients with severe burns and in debilitated patients of all types the hypoproteinemia precedes and is a direct cause of the ulcer. In paraplegics the hypoproteinemia is secondary to the exudation of protein from the decubitus.

Obviously, it is best to prevent decubiti if possible, first by the maintenance of adequate nutrition, and secondly by the avoidance of prolonged pressure. Once ulcers have formed they are difficult to control. Aside from any other consideration, decubitus ulcers increase tremendously the nursing care required for these patients.

Plastic closure of such ulcers has been recommended by many investigators[1,2,7] since the termination of World War II. Ulcers which have attained a large size, however, are usually infected and necrotic. Furthermore, the underlying viable tissue may be so ischemic that a plastic closure or the application of a skin graft is out of the question. No method of treatment of these lesions is satisfactory unless pressure is removed from the area.

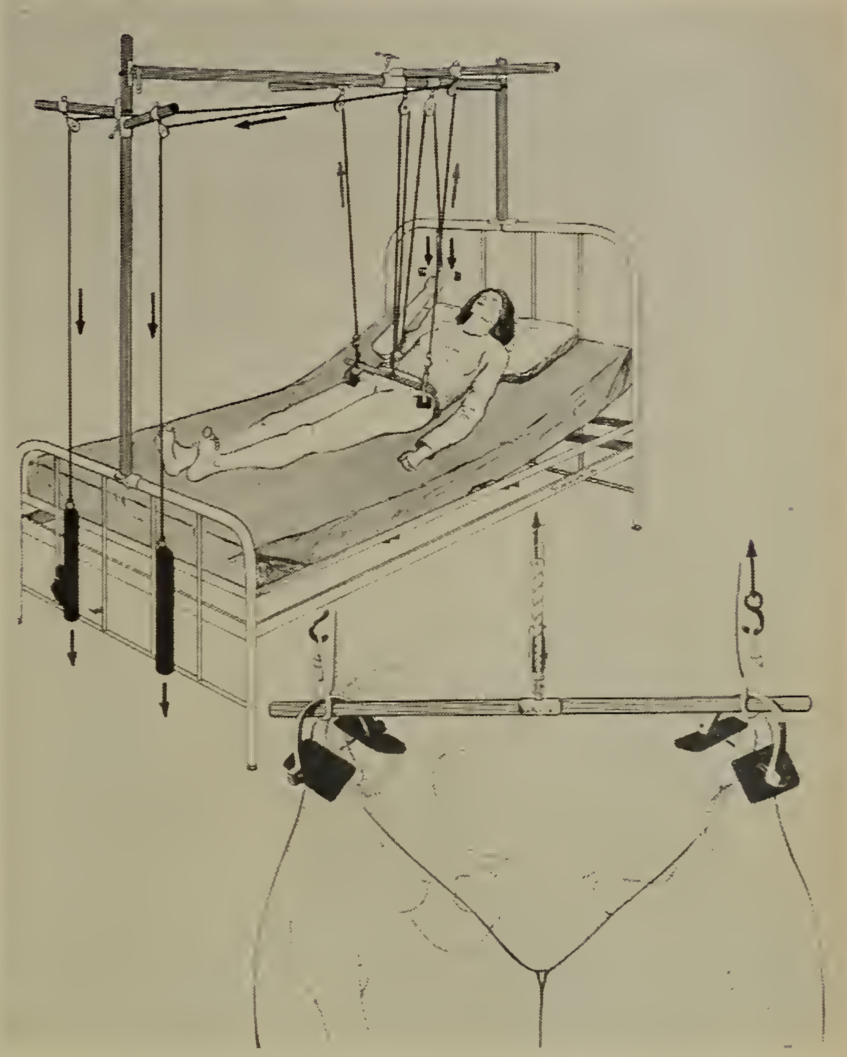


Figure 1.—Skeletal suspension through the iliac crests.

The usual methods of avoiding pressure by the use of air rings, air mattresses and routine turning of the patients are fairly satisfactory for the treatment of smaller decubiti, but are inadequate for the control of extensive ulcers. A procedure which more effectively reduces pressure on the affected areas is the use of overhead suspension by means of Kirschner wires placed through the iliac crests. This method was described by Westhues[6] and by Klapp[3] in the German war literature, and experience with it was reported by Schneider and Stapff.[5] The author has used the method, with modifications.

METHOD

With local anesthesia (in paraplegic patients anesthesia is unnecessary) Kirschner wires are drilled through the most anterior portions of both iliac crests, the wires being placed as deep in the ilium as the configuration of the patient's body will allow. To avoid slipping of the wire and consequent pressure, heavy felt should be placed between the inner sides of the bows and the patient's skin. (Figure 1 shows the procedure in detail.) The wire

---

From the Department of Surgery, University of California Medical School.

spreader bows are hooked onto a spreader bar and traction is applied by means of weight. Depending upon the weight of the patient, the weight on each bow varies from 20 to 25 pounds, but the traction should not be heavy enough to lift the patient from the bed. A rope attached to the middle of the spreader bar has a handle on the other end which enables the patient to raise himself whenever it is necessary to use a bedpan or change the dressings. All traction is released several times a day and the patient is turned on either side for periods of one hour each. This method has been used even in the presence of rather moist dressings around a suprapubic drainage tube.

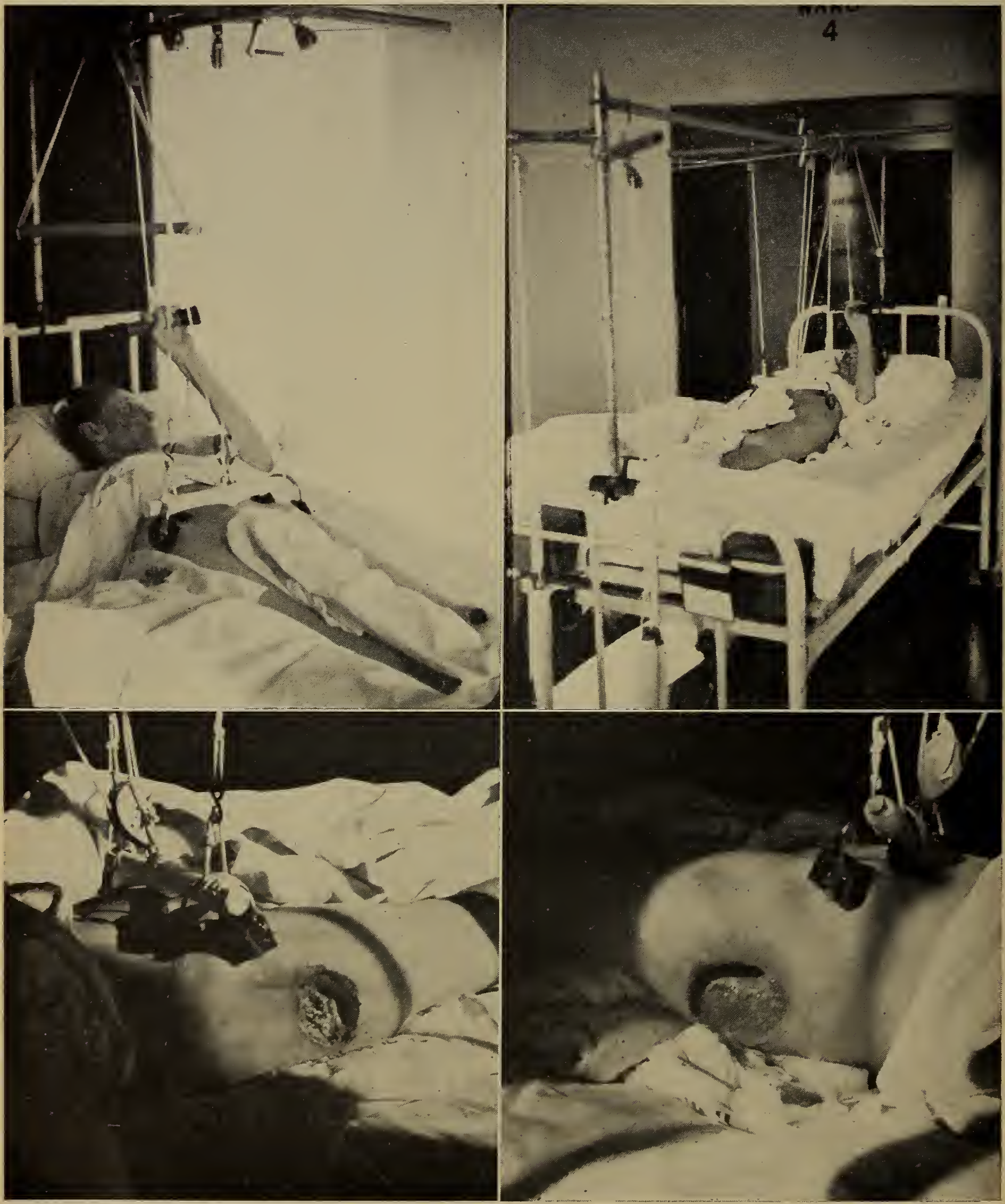


Figure 3.—Photographs of a patient with multiple decubiti who has iliac suspension. Upper pictures show the overall arrangement of the skeletal suspension set-up. The lower pictures show a Kirschner wire placed through the iliac crests with the felt pads protecting the skin from the wire bows. Bilateral trochanteric decubiti are also shown.

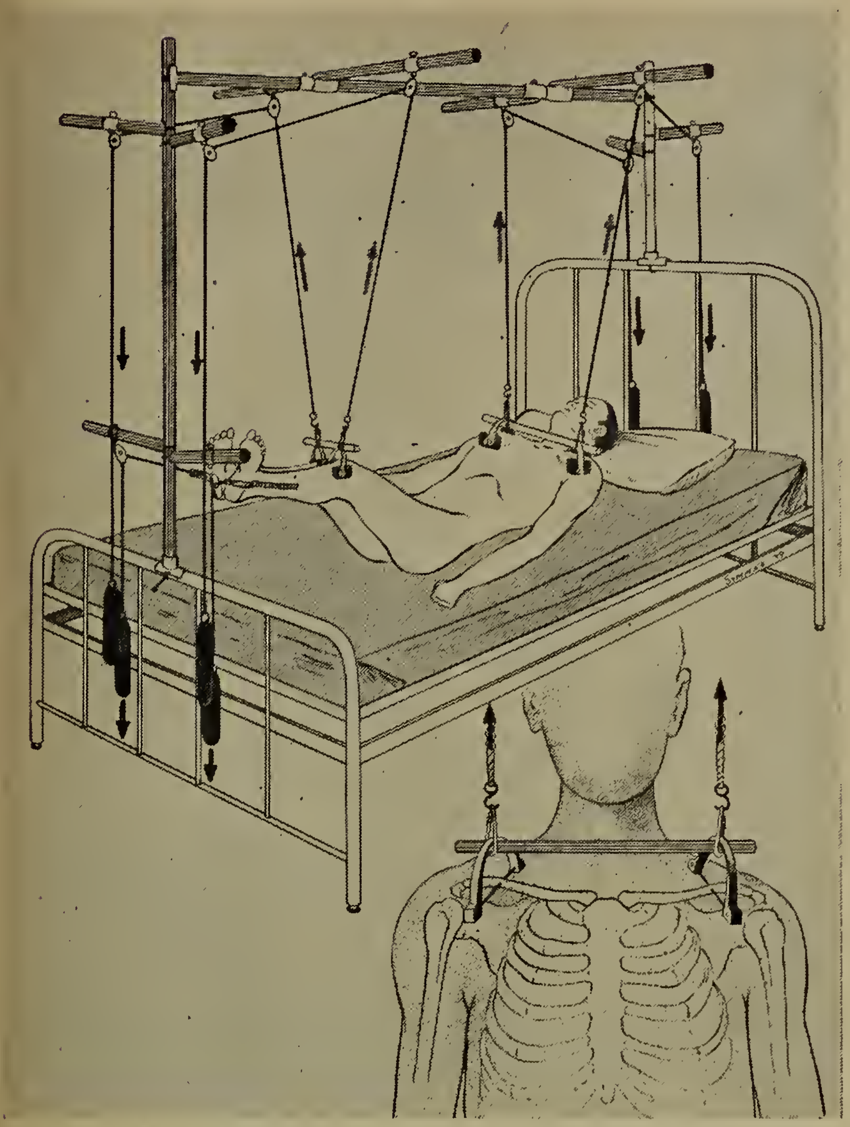


Figure 2.—Skeletal suspension through the clavicle and through the tibial tuberosities.

Pressure sores over the scapulae and thoracic spine may require some shoulder girdle suspension. Obviously, not much weight can be used. A method of suspension by Kirschner wires through the clavicles is diagrammed in Figure 2. As the patients are all considerably underweight, no difficulty is encountered in placing a wire through the midportion of the clavicle. Again it is advisable to pad the inner sides of the bows to avoid slipping of the wires with consequent pressure sores. The author has put only five to ten pounds weight on each of these wires lest more traction dislocate the clavicles.

By means of this overhead suspension even extensive, infected decubiti have been brought under control. With avoidance of pressure further spread and extension of decubiti is prevented, and after several weeks of this balanced suspension the blood supply to the ulcerated area improves. Necrotic skin and underlying tissue are excised and the bed of the ulcer is ready for skin grafting or plastic closure. Skin grafts applied to these ulcers have taken whenever pressure on the grafted area could be prevented.

The method described has been employed principally in patients with injury to the spinal cord. It is suitable for the treatment of bedsores resulting from other causes, with the following exceptions:

1. In civilian practice occasionally a patient is encountered who has been bedridden for years with the eventual production of sacral decubiti. Osteoporosis is always present in such patients and the iliac bone is not strong enough to sustain a Kirschner wire. It has been suggested by Klapp[3] that, for heavy patients, additional overhead support can be obtained by means of transfixion of the symphysis and both pubic bones with a Kirschner wire. The author has had no experience with this method, but it might be of value in patients with osteoporosis.

2. In patients with burns or wounds involving the iliac crests or with nearby draining colostomies, it is of course inadvisable to use iliac suspension. In one such case, as shown in Figure 3, Kirschner wires were placed through both tibial tubercles and some of the pelvic weight supported in this manner. The weights used should allow the patient's back to rest lightly on the bed so that a hand may be slipped between the patient's back and the bed without difficulty. The adhesive skin traction on the lower legs is used merely to support the lower legs. Right angle suspension of the legs such as that used in the treatment of fractured femurs in infants is impractical because of the poor circulation in these patients.

Balanced body suspension by means of Kirschner wires placed through the iliac crests is useful in the care of patients with large decubiti. Shoulder girdle suspension to prevent pressure on the scapulae can be obtained by placing Kirschner wires through the clavicles.

REFERENCES

1. Freeman, B.: The treatment of bedsores in paraplegic patients, Surgery, 21:668-674, Mar. 1947.

2. Gibbon, J. H., and Freeman, L. W.: The primary closure of decubitus ulcers, Ann. Surg., 124:1048-1164, Dec. 1946.

3. Klapp, W.: A note upon R. Klapp's method of pelvic suspension, Zeit F. Chirurg., 69:1567-9; Abs. Bull. of War. Med., 3-493, 1942-43.

4. Mulholland, J. H., et al.: Protein metabolism and bedsores, Ann. Surg., 118:1015-1023, Dec. 1943.

5. Schneider, J., and Stapff, R.: Experience with Klapp's method of wire suspension, applied to the pelvis, Zeit F. Chirurg., 69:1559-66.

6. Westhues, H.: Half suspension of the pelvis, Der. Chirurg., 14:489-93, Aug. 15, 1942; Abs. Bull. War. Med., 3:440, 1942-43.

7. White, J. C., and Hamm, W. F.: Primary closure of bedsores by plastic surgery, Ann. Surg., 124:1146-47, Dec. 1946.

Detection of Pulmonary Tuberculosis

Comparative Value of Routine Radiologic Examinations and Routine Laboratory Procedures

Homer D. Peabody, Jr., M.D., and R. H. Sundberg, M.D., *San Diego*

SUMMARY

The abnormalities disclosed by the usual laboratory diagnostic procedures (blood cell count and hemoglobin determination, sedimentation rate determination, urinalysis, and serologic test for syphilis) are compared with the number revealed by stereophotoroentgen chest examination in a series of 951 patients.

The number of significant abnormalities uncovered by the routine stereophotoroentgen examination of the chest was comparable to the number disclosed by the usual laboratory procedures used in patient evaluation.

Some form of radiologic examination of the chest should be included in the routine laboratory procedures required for patient evaluation.

THE value of some form of radiologic chest examination in the detection of unsuspected pulmonary tuberculosis has been proved by numerous surveys. The value of such a procedure as a routine part of the complete patient evaluation, however, has not been generally recognized or admitted. Certain laboratory studies, namely, urinalysis, blood cell count, sedimentation rate determination, and serologic examination for syphilis, are considered essential parts of such a case study, and omission of them would be cause for criticism in most clinics and hospitals. Unless there are specific complaints referable to the respiratory system, however, radiologic chest examination may not be made. The study to be reported here was undertaken for two reasons: (1) to compare the number of significant abnormal findings disclosed by the usual laboratory procedures and by roentgen examination of the chest, in the same series of patients, and (2) to demonstrate, on the basis of the comparative amount of pulmonary disease thus uncovered, the value of including some form of radiologic examination of the chest among the routinely required laboratory procedures for patient evaluation.

It has been reported that routine blood cell counts reveal blood dyscrasias in a small fraction of one per cent of patients.[10]

Joslin[6] estimated that routine analysis of urine uncovered diabetes in 0.4 per cent of patients examined. Wilkerson and Krall[11] reported a survey of 3,500 citizens of Oxford, Massachusetts, in which 40 cases of diabetes known to physicians, and 30 additional unknown cases, were found. It is estimated that there are at least 1,000,000 undiagnosed cases of diabetes in this country.

Routine serologic tests for syphilis were positive in 2.4 per cent of white males examined for Selective Service.[9]

Tuberculosis revealed by mass chest radiography in United States Selective Service examinations was the cause of rejection in 1.4 per cent of examinees.[3] Graham[2] reported that in a series of 2,067 obstetrical patients observed in private practice, routine roentgenologic chest examinations revealed active tuberculosis in 0.77 per cent and significant parenchymal disease in 3.44 per cent. Block and his associates[1] found significant abnormalities by fluoroscopic examination in 21.3 per cent of 15,000 University of Chicago students. They concluded that in the 15 years prior to the introduction of routine x-ray examination, 3,000 patients with clinically important pulmonary tuberculosis passed through the outpatient department without detection of the disease. They estimated that throughout the country 600,000 tuberculous perons undergo medical examinations each year without detection of this condition. Hodges[5] at the University of Michigan Hospital found, by photofluorographic chest examination of 7,841 patients, deviations from normal in 14.1 per cent and abnormalities demanding more extensive x-ray examination in 9.3 per cent.

In a study of 153 patients with carcinoma of the lung Overholt[7] discovered that in 60 per cent not only had an incorrect diagnosis been made, but treatment based on that diagnosis had been maintained for long periods of time. In the series he reported, the length of time elapsing between the onset of symptoms and consultation with a physician averaged three months. Three months more elapsed before the physician requested chest x-ray studies, and the correct diagnosis was not made until another six months had passed. Thus definitive treatment was delayed for an average of nine months from the time of the first consultation. Early chest roentgenograms with necessary additional study would have obviated many months of delay.

From the Department of Diseases of the Chest, Rees-Stealy Clinic, San Diego.

The figures cited are the results of independent surveys in different groups of individuals. In the study here reported the results of five laboratory procedures, all applied to each patient, are compared.

For this purpose, the records of 951 patients, treated on a private practice basis, who consulted the diagnostic section of this Clinic from August through December, 1947, were taken at random. No records of hospitalized patients were included. There were 336 males and 615 females in the series. The ages ranged from 12 to 82 years with an average of 42.9 years for males and 40.5 years for females. In all of these cases, a full history was taken, a complete physical examination made, and laboratory procedures consisting of a complete blood cell count, hemoglobin and sedimentation rate determinations, urinalysis, serologic examination for syphilis, and stereophoto roentgen examination of the chest were carried out. Other investigative procedures depended upon indications in the individual case. It should be emphasized that many patients with specific chest complaints were not included in the group, since such patients were sent directly to the department of diseases of the chest for study. Neither were any obstetric patients included. With these two exceptions, the series represents a cross-section of adult patients observed in private practice.

PHOTOROENTGEN CHEST STUDIES

The merits of various screening methods for chest disease will not be discussed here. Hilleboe and Morgan[4] have covered this subject well. This clinic uses the photoroentgen method which utilizes the 4x5 inch stereo film, the advantages of which have been summarized by Potter, Douglas, and Birkelo.[8] It is the opinion at this clinic that photoroentgenograms made by this method, when interpreted by a competent roentgenologist, constitute a dependable screening method for existing chest disease. The inconvenience to the patient is slight and no more time-consuming than the drawing of a blood sample.

Analysis is based on results of chest photoroentgenograms in 951 cases. Normal findings were reported in 758 cases (79.7); some form of definite abnormality was found in 148 cases (15.6 per cent); and equivocal or indefinite findings in 45 cases (4.7 per cent). (See Table 1.) The percentage of cases in which definite abnormalities were found is slightly lower than that reported for screening methods by other observers. There are three possible explanations for this difference: (1) although further roentgenographic investigation in the 45 cases in which indefinite or equivocal findings were reported revealed significant abnormalities in a high percentage of them, these were not included in the total figure; (2) few patients with specific chest complaints were included in the study; and (3) minor deviations from normal (minute calcifications) were considered insufficient to warrant a report of abnormality.

Table 1.—*Results of Stereophotoroentgen Chest Examinations*

	No.	Per Cent
Patients examined	951	
Patients with abnormalities	148	15.6
Patients requiring additional roentgenographic study	45	4.7
Patients with negative findings	758	79.7

Table 2.—*Abnormalities Revealed by Stereophotoroentgen Examination in 951 Cases*

		No.	Per Cent
Lung lesions		77	8.1
Minimal tuberculous lesions	7		
Hilar and parenchymal calcification and/or scarring	55		
Pulmonary fibrosis	6		
Increased markings	4		
Emphysema	4		
Thoracoplasty for tuberculosis	1		
Pleural lesions		10	1.1
Calcified pleura and/or old scarring	7		
Pleural effusion	3		
Cardiovascular lesions		44	4.7
Enlarged heart	34		
Enlarged aorta	9		
Aortic aneurysm	1		
Skeletal lesions		7	0.7
Scoliosis	3		
Fractured ribs	2		
Tuberculosis of spine	1		
Osteomyelitis of rib	1		
Tumors		2	0.2
Dermoid cyst	1		
Enlarged nodes	1		
Miscellaneous		8	0.8
Cervical rib	2		
Thyroid enlargement	4		
Substernal thyroid	1		
Calcified cervical nodes	1		
Abnormal photoroentgenograms		148	15.6
Additional roentgenography requested		45	4.7
Negative photoroentgenograms		758	79.7

A summary of abnormalities found is given in Table 2. Significant pulmonary disease was found in 21 cases (minimal active tuberculosis in seven, pulmonary fibrosis in six, emphysema in four and abnormally increased markings in four). Definite evidence of parenchymal disease characterized by hilar or massive calcifications throughout both lung fields was noted in 55 cases. The incidence of minimal tuberculosis (seven cases) is significant and should be emphasized.

SEROLOGIC EXAMINATIONS FOR SYPHILIS

The reaction to the standard Kahn test for syphilis was positive in eight (0.84 per cent) of the 951 patients examined and results of Kolmer-Wassermann tests were positive in six cases (Table 3). In these eight cases, a diagnosis of syphilis was made and treatment instituted.

SEDIMENTATION RATE DETERMINATIONS

The Westergren method of determining the sedimentation rate was used in this study. The normal value for males is usually considered to be from 0 to 15 mm. and for females from 1 to 20 mm. in one hour. Many of the workers at this clinic feel that these accepted normal values are too low; they consider a significant rate to be over 20 mm. in one

TABLE 3.—*Results of Serologic Tests for Syphilis*

	No.	Per Cent
Total number of cases	951	
Positive reactions	8	0.8
Negative reactions	943	99.2

hour for males and over 30 mm. for females. On the basis of the latter values, there were 159 patients (16.8 per cent) with higher than normal rates (Table 4). Of these, 58 were males and 101 females. It should be pointed out that these reported levels of sedimentation activity were not corrected for anemia and that slight anemia was frequently present.

TABLE 4.—*Results of Sedimentation Rate (Westergren) Determinations**

	Male	Female	Total	Per Cent
Total number of cases	336	615	951	
Abnormal rates	58	101	159	16.8
Normal rates	278	514	792	83.2

*Normal range: Males 0-20 mm., females 0-30 mm. in one hour.

HEMOGLOBIN DETERMINATIONS

Blood-analysis in all cases in this series included determination of hemoglobin concentration, and counts of erythrocytes, leukocytes and differential leukocytes, but only the hemoglobin concentration values have been tabulated. Inasmuch as most deviations from normal in the blood analysis occurred in the hemoglobin value, it is considered satisfactory for this comparative study. On the basis that 15 gm. of hemoglobin per 100 cc. of blood equals 100 per cent, the hemoglobin concentration values were below 75 per cent (11.5 gm. per 100 cc.) in 70 cases (7.4 per cent) (see Table 5). In four cases the patients were males; in 66, females. No cases of leukemia or other blood dyscrasias were observed in this series.

TABLE 5.—*Results of Hemoglobin Determinations**

	Male	Female	Total	Per Cent
Total number of cases	336	615	951	
Abnormal results	4	66	70	7.4
Normal results	332	549	881	92.6

*Normal: 11.5 gm. per 100 cc. (75%) to 15 gm. per 100 cc. (100%).

URINALYSES

There were significant deviations from normal in the urine of 124 patients (13.1 per cent) (Table 6). Sugar appeared by the Benedict's reducing test in five cases, and in all of these cases further studies revealed the presence of diabetes mellitus.

DISCUSSION

A numerical summary of the abnormalities disclosed by the usual laboratory procedures and by the routine stereophotoroentgen chest examination in the series of 951 patients is given in Table 7. These findings are evidence of the importance of these laboratory procedures in the evaluation of the patient's condition either as screening procedures or as specific tests. The fact that most patients referred directly to the department of diseases of the chest were excluded from this study gives added significance to the results of stereophotoroentgen examination of the chest in routine practice.

TABLE 6.—*Results of Urinalyses*

	No.	Per Cent	No.	Per Cent
Total number of cases			951	
Abnormal results			124	13.1
Leukocytes	54	5.7		
Erythrocytes	8	0.9		
Albumin	57	6.0		
Sugar	5	0.5		
Normal results			827	

TABLE 7.—*Summary of Results of Routine Laboratory Procedures in 951 Cases*

	Number of Cases in Which Abnormalities Were Present			
Procedures	No.	Per Cent	No.	Per Cent
Photoroentgen chest examinations			148	15.6
Significant pulmonary disease	21	2.2		
Minimal active tuberculosis	7	0.7		
Cases in which additional roentgenographic chest study was required	45	4.7		
Serologic test for syphilis			8	0.8
Sedimentation rate (Westergren) determination			159	16.8
Hemoglobin determination			70	7.4
Urinalysis			124	13.1
Sugar reduction for diabetes	5	0.5		

The number of patients in whom clinically significant abnormalities were demonstrated as a result of the photoroentgen chest examination, was comparable to or greater than the number of patients in whom significant abnormalities were demonstrated by laboratory screening procedures usually considered essential — hemoglobin and blood sedimentation rate determinations, and urinalysis. The number of cases of clinically important pulmonary tuberculosis uncovered as a result of further study of chest abnormalities was comparable to the number in which disease was revealed by the more specific serologic examination of the blood for syphilis and to the number in which diabetes mellitus was disclosed by further studies in cases in which sugar was found in the urine.

It is the authors' opinion, as a result of this survey, that some form of radiologic examination of the chest is as important in the evaluation of a patient as are the laboratory procedures which are usually considered essential in such an evaluation.

REFERENCES

1. Block, R. G., and Tucker, W. B.: Indispensability of routine x-ray examinations of chest in general clinic, Am. Rev. Tuberc., 50:405-417, Nov. 1944.

2. Graham, H. K.: Routine chest roentgenograms in pregnancy; a supplementary study, West. J. Surg., 55:438-441, Aug. 1947.

3. Greve, C. H., Clark, M. L., McGill, K. H.: Physical examinations of Selective Service registrants, January 1944-August 1945, Medical Statistics Bulletin No. 4, National Headquarters, Selective Service System, Washington, D. C., June 1, 1946, p. 12.

4. Hilleboe, H. S., and Morgan, R. H.: Mass Radiography of the Chest, Year Book, Chicago, 1945, pp. 22-42; 98-125.

5. Hodges, F. J.: Fluoroscopic examination of the chest, Radiology, 38:453-461, April 1942.

6. Joslin, E. P., Root, H. F., White, P., and Marble, A.: The Treatment of Diabetes Mellitus, Lea & Febiger, New York, 7th ed., 1940, p. 38.

7. Overholt, R. H.: A common masquerading lung disease, New York State J. Med., 42:1657-1662, Sept. 1, 1942.

8. Potter, H. E., Douglas, B. H., Birkelo, C. C.: The miniature x-ray chest film, Radiology, 34:283-291, March 1940.

9. Results of serological blood tests for syphilis on Selective Service registrants, U. S. Public Health Service, Federal Security Agency, Oct. 1942.

10. Wilson, N. J.: Early diagnosis of disease of the chest, New England J. Med., 232:301-309, March 15, 1945.

11. Wilkerson, H. L. C., and Krall, L. P.: Diabetes in a New England town, J.A.M.A., 135:209-216, Sept. 27, 1947.

A Simple Infant Transfusion Kit for Occasional Use

W. R. MacLaren, M.D., *Pasadena*

MANY occasions on which a small transfusion would benefit a sick or convalescent infant are passed up because of the technical difficulties involved. Usually the major stumbling block is lack of equipment, particularly sterile tubing. Few physicians care to assemble, autoclave and put aside equipment that is used so seldom.

However, a satisfactory infant transfusion set can be assembled on short notice from materials already available in most offices. Required are:

- One 50 cc. syringe with adapter.
- One 10 cc. Luer-Lok® syringe.
- One three-way stopcock (from lumbar puncture set).
- One set disposable plastic intravenous tubing (Baxter or Abbott).

The plastic tubing is packed in sterile condition, has a needle adapter on one end, and costs little. After the syringe and three-way stopcock are boiled, a length of the plastic tubing (15 to 20 inches) is cut with sterile scissors and attached to the small arm of the three-way stopcock where it is firmly tied with heavy thread. The needle adapter and any other slip joints in the tubing are also tied. The assembly is completed by attaching the two syringes to the proper arms of the three-way stopcock. The plastic tubing is discarded after it has been used.

A suggested routine for using the kit in the office follows:

The blood of the infant and of the donor is cross-matched. An 18-gauge needle is attached to the 50 cc. syringe and 8 cc. of sterile 2.5 per cent sodium citrate solution placed in the syringe. Forty-five cc. of blood is drawn rapidly from the donor so that the turbulence in the syringe produces adequate mixing of the blood and citrate without shaking.

The 10 cc. syringe, which is in place on the three-way stopcock, is used to fill the stopcock, the tubing and the needle with sterile saline solution (from a rubber capped vial) and a few cubic centimeters of the solution is left in the syringe. After the needle is inserted under the skin, gentle traction on the syringe will bring blood into view in the adapter as soon as the vein is entered. This is very helpful in dealing with small veins.

The large syringe is then attached to the three-way stopcock and blood introduced either directly or by repeatedly filling the 10 cc. syringe. The smaller syringe is the more easily controlled.

Many variations suggest themselves. If only slight pressure is needed, the large syringe can be suspended as a gravity reservoir. After the blood has been given, a saline drip can be connected to the three-way stopcock if desired.

The advantages of this arrangement are: (a) the parts are standard items of office equipment; (b) the parts can be assembled in a few minutes, and returned to their ordinary function after use; (c) the use of disposable plastic intravenous tubing is inexpensive and makes autoclaving and storage of rubber tubing unnecessary.

127 North Madison Avenue.

Psychiatric Problems in Children

Part II

S. A. Szurek, M.D., *San Francisco*

In the article printed in the May issue of this journal, three large groups or kinds of psychiatric disorders of children were reviewed. I suppose that in certain important respects they are of least interest to a group of general practitioners. The syndromes of childhood neurosis, psychosis and aggressive behavior disorder are all of them least likely to come to your attention—or at least, less often than some others. These syndromes are really the end-products or, more precisely, very extreme forms of psychiatric disorder in childhood. They require relatively little specialized experience or training to recognize and their severity and chronicity are such as to require the time as well as the competence which the busy practitioner cannot perhaps be expected to possess and to give. Also it is probably less important that the correct, shorthand diagnostic title be applied to the disorder by the physician who is consulted about one of these severe disorders than that he direct the family to appropriate facilities prepared to make some effort for the care and treatment of the patient.

This referral for treatment is of itself a serious problem because of the great shortage of psychiatric clinics for children everywhere in this country and of insufficient trained personnel to staff such clinics as exist. The amount of time as well as trained skill (which itself takes years to acquire) which is necessary to be even of some help in these serious disorders is such that most existing clinics even with fairly large staffs are usually overburdened and struggle with long waiting lists for admission.

Nevertheless, there may have been some advantage in reviewing these gross clinical forms of disorder. The advantage consists in that they may be orientation points from which to understand the overwhelming majority of minor, less severe disturbances of children, most of which do not come very near to fitting into any of the three categories that were reviewed. I mean that a very great number of children brought not only to general practitioners but to child psychiatrists as well have symptoms—or at least their parents have complaints about them—which cannot be easily classified either as neurotic or psychopathic. Such children show mixtures of both types of difficulty—that is, symptoms of neurosis and of behavior disorder concurrently. They manifest, in other words, peculiar combinations of neurotic conflict *and* difficulty in self-restraint of their hostile aggressive or of their innate egocentric impulses. One sees, for example, quite frequently children who, in certain situations or at certain times, find it impossible to restrain their cruelty, or to be frank, honest, and to respect others' property and at other time show severe phobias, night terrors, or other somatic neurotic symptoms.

COMPLAINTS FREQUENTLY MADE BY PARENTS

Parents also complain that a child may be at once intimidated and fearful with his peers and excessively autocratic and abusive with younger children or siblings, while at the same time fidgety, restless generally, a poor sleeper and subject to frequent gastrointestinal upsets. Frequent, too, are the complaints about the difficulty in acquiring personal and social habits or discarding more infantile traits at later chronological ages. Persistent thumb-sucking, for example, with the current warnings from orthodontists that it may lead to severe malformation of the dental arches, is a frequent subject of much parental anxiety. Enuresis, diurnal as well as nocturnal, and recurrent fecal soiling, poor appetite with some malnutrition and susceptibility to minor infections, or frequent and severe temper tantrums, destructive and violent hostility to a younger sibling expressing unresolved, extreme rivalry, and a host of other such individual complaints with little or no evidence of a more total or severe neurotic disorder, may be the immediate reason for the consultation. Masturbation, excessive sexual curiosity and preoccupation often frighten parents, while repeated episodes of stealing sometimes raise visions of future criminality. Literally, the list of such individual combinations of symptoms and behavior difficulties is almost inexhaustible and I am certain it can be supplemented almost endlessly by everyone of you out of your own experience in practice. All this does not even touch upon a similar variety of difficulties and anxieties parents have with infants and young children under two or three years of age with respect to feeding, elimination, general health and primary socialization and domestication in habit training of cleanliness, self-care, and so forth.

All these congeries of symptoms and problems, all these less severe and in-between conditions, make it necessary to formulate a wider conceptual frame-

---

Second of two lectures in the course in psychiatry for the general practitioner, sponsored by the University of California Medical School, University Extension, presented at the Langley Porter Clinic, February 3, 1949.

From the Department of Child Psychiatry, the Langley Porter Clinic; University of California Medical School, San Francisco.

work and viewpoint than that of the traditional nosological entities we have discussed. We need, in other words, a way of looking at the otherwise bewildering variety of physiological and psychological disturbances of children which will be more useful to the medical man than the notions of individual neurosis, psychosis or behavior disorder. It is at this point that I feel I can tell the experienced general practitioner little that he does not already know and understand.

The physician established for some years in a community begins to know not only the physiological condition of the individual patient, child or adult, who may over a period of time consult him repeatedly. He begins to know his patient as a person, that is, as a unique member of a particular family and of other groups with a particular vocation and avocational interests and adjustments, with particular hobbies, preferences, aversions, with a certain intelligence and social and economic and educational background and status; in short, the physician comes to know the patient's advantages and disadvantages. The physician acquires in his repeated visits to the home or as a result of indirect information from other patients and other members of the community a great deal of knowledge and information about the family which is highly relevant from the psychiatric point of view—or, better, from the point of view of total, or integrated medicine. (Some people prefer to use the currently popular term of "psychosomatic medicine.") The doctor learns in the form of privileged communication, or from his direct observations while in the home, what the actual relations of various members of the family to one another and to others in the community are. He learns how the mother feels and treats the father and vice versa, how each of them feels about and treats each of their children, and how each is still tied to, rebellious against, or comfortably independent of, his own parents or the in-laws. Who better than the doctor—except, perhaps, the minister, priest or lawyer—knows the crises of the family's life and its recurrent problems in living? If the physician has some of the equanimity which Osler extolled, if he acquires the wisdom, patience, firmness, which may come with experience, maturity and age, he will be and often is admitted further than into the physical sanctum of the private sick-room of the home. He will be admitted to some of the inner recesses of the family's guarded secrets, confidences and troubles; in short, he will be admitted to their feelings. If over the years he proves himself a worthy confidant, a sturdily optimistic, fair-minded helper in those crises for which his assistance is sought, if he respects himself and all the potentialities and values of each of the persons of the whole family, he becomes gradually invested, by their feelings for him, with a therapeutic power for their welfare which with the chemicals he prescribes or the operations he performs on their bodies may perform even greater miracles of healing than perhaps even he thought were possible.

What I am trying to say in perhaps a roundabout way is that from the point of view of the child's welfare—somatic and psychological—this position and role of the family physician carries with it at least the possibility of all the knowledge necessary to understand the queerest quirk of the child's behavior and emotional state. This position, this relation of the doctor to the family—symbolized by the emotionally charged and mutually meaningful phrases of "our doctor" and "my patients" or "my family"—also has, as all of you very well know, psychotherapeutic potentialities already implicit in it which it may take a psychiatrist or a psychiatric clinic staff weeks, months, or longer to achieve.

In other words, the child is a human organism, at first utterly, and later relatively, dependent upon its parents or other adults, who is always tremendously affected in whatever genetic potentialities he has by not only the impersonal food, protection against extremes of temperature, and against infection or other injury, but also by the totality of the personal, the feeling, environment. As a matter of fact, it is becoming clearer and clearer to most of us that even superior intelligence and the most robust physical inheritance and measures to provide minimal standards of somatic health and care do not necessarily by themselves insure the fullest development and solid integration of the person. The human animal becomes the kind of human being which his immediate personal, familial environment and later social situation permit him to develop into, with his particular, genetically acquired potentialities. If he is wanted, if his parents enjoy having him, and if he finds a stable justice as between himself and his siblings, the young human animal has then a good chance of coming *to feel* as a worthwhile, self-respecting person and member of his family and later of any larger communal group. If his earliest and *necessarily egocentric,* sensual needs of self-exploration, of muscular activity and developing skills are gratified and are not stunted by whatever dark anxieties adults often have, he is not likely at one and the same time to be driven faster and farther than his given maturational stage can take easily, and not likely to become divided in himself, guilty and anxious about some of his bodily impulses and sensations and hence secretly and insatiably longing to return to kinds and quantities of sensation and behavior really denied and prohibited to him earlier. If, on the other hand, he is not smothered by an anxious oversolicitude which has more to do with a mother's or father's secret longing to relive some indulgences denied *them* as children rather than with the child's actual needs for care, for easy warmth of affection, for opportunities for independent trial-and-error learning, and for mastery of his emerging muscular power and dexterity, then the child can also gradually and as a matter of course accept *as his own attitudes,* that is, identify with, such general rules of respect for the feelings and welfare of others as are indispensable to organized, interdependent, social living. If at all stages of his growth real and basic respect is paid to his rights within the family community; if he is frankly, firmly and honestly dealt with; if opportunities for his play, pleasure and learning are provided as generously as is possible; if his faltering efforts at learning are not derided; if his failures are met with steady sympathy and encouragement and with no trace of the pity which so often hides some gleeful contempt, then he will reflect this experience later in a sturdy, courageous, honest sense of self-respect which will be infused with realistic optimism and a generosity first towards himself and then towards others which will not permit exploitation by others, nor demand ingratiating submissiveness from them. Under such circumstances hateful envy may be minimal, and capacity to benign helpfulness, to collaboration with others of his communal groups, and even more important, a deep ability to love a mate fully may be maximal with neither unnecessary inhibitions in sexual satisfaction nor guilty and obsessional preoccupation with partial eroticisms. What is more, such a child, as a later adult, with neither secret nor repressed longing for childhood satisfactions nor fear of their healthy gratifications, can—*as a parent*—permit *his* child also to live through each developmental period with minimal qualms, maximal security, and thus contribute to his solid and unhurried growth into adolescence and adulthood.

Merely to recount such "ifs" about a child's experience with adults is, I think, sufficient to make my point. It suffices, I hope, to recall to your minds the numerous family situations which you have known and know currently in which many of these "if" conditions were wholly or partially absent. It is probably unnecessary for me to detail some of the typical difficulties which make it almost impossible for parents to provide in their own feelings towards themselves and each other even an approach to these ideals of emotional atmosphere for their child or their children. We all of us know how often parents of the present generation grew up in a home, in a community, in a world quite different from the one they live in now. By different, I mean, of course, one which did not prepare them as well as it might for the present world. *Their* parents may have been born in another part of the world, with another language, with customs different from those in the United States of America, with attitudes towards children and life which did not easily mesh with those of people around them in this country. Their life may have been difficult economically and socially. If these parents of present parents *were* born in this country, they may also have had different attitudes and customs than this country generally had or has now.

In any case, it is not uncommon that the life of present parents during their childhood did not prepare them to live with sufficient equanimity through major, widespread, violently fluctuating economic cycles, perhaps through two world wars, and to the rapidly changing relations of nations of the world to one another with atomic energy as a new sword of Damocles hanging over all. Although intelligent, they may either not have had the opportunity nor learned the persistence to get adequate training of their potential skills to assure them a satisfying vocation and status later. A good many mothers of this generation have had less experience of helping *their* mothers with housework, and they have learned that at least to some extent a woman is almost as good as a man in many occupations and professions. This newer freedom—exemplified by less general horror about their smoking, drinking, going to various schools of higher learning and even participating in many sports and athletics—however, is still only partial and, I suppose, many men still dislike to feel their wives are as smart as they, or could earn almost as much money as they, and sometimes could get along without them. Notice here that these more and more rapidly changing mores of intersexual relations affect both the men *and* the women. Neither is wholly sure what he or she may be or ought to be in relation to the other. Oscillations in both men and women between the old attitudes (man dominantly superior — woman submissively and clingingly inferior) and the new not yet clearly established attitudes of some equality of value as persons of both sexes are frequent. Secret envies, buried but covertly active, hatreds in both for themselves and each other are often laughingly mentioned as the "eternal war between the sexes," but they wreak havoc upon marital happiness, upon adequate sexual satisfaction and, not least, for our problem here, upon successful parenthood.

These changing customs, attitudes and ethics are general conditions, you may say, and not necessarily true of a particular family, and, in a sense, you will be correct. In a specific family history it is more important to learn what happened and is happening to lessen the satisfactions and the security of the parents as adult citizens in a particular community. (In this connection, how frequent is it that families have since their grandparents' day remained in the same community, with their own home, their own familial status?) Has the father the job he enjoys with fairly certain prospects of continued employment, of improvement in salary and status, security for health and old age? Does he worry about how much he owes to his old widowed mother, or does he fret about how much longer he'll be able to stand his mother-in-law around, either in his own home or nearby? Is he tempted to thoughts or deeds of infidelity and does he feel guilty about it because his wife has aged, is too tired, too harried, or too insistently demanding that he continue to baby *her* as well as the children? Does his wife become more panicky at all these more or less subtle signs of loss of his affection, and, in reaction, either naggingly demand more than he can give or become entangled with one or more of her children emotionally who in turn reacts with a mixture of rebelliousness and neurotic anxiety? Did the parents of either of the parents die at a time critically difficult for either the husband or the wife? Did either the father or the mother immediately upon birth prefer the son or the daughter with corresponding resentful reaction of the rest of the family at their exclusion? Did the second child come too soon after the first one, or at a time when the tension between the parents was highest in their marital history? Was the child only more or less the trick of either parent upon the other to bind the straying one? Or, was the child the result of a sentimentally, but self-deceptively, agreed contract between them to save their marriage after some years of sterility when it was near its ebb; and incidentally, was it urged upon them by friends or even by their doctor? Or, finally, was the child in common parlance an "accident" at a time when neither parent felt ready for it? Again, was the child of the sex opposite to that hoped for and desired by both?

These and many, many other similar questions about the actual, even if hidden, facts and combination of events in the family's life need to be considered as possibilities in the etiology of whatever emotional, behavioral or psychosomatic disorder the child may manifest at a given age. When the child is older and has perhaps lived through some of these unfortunate familial circumstances and events, it may seem as if extrafamilial difficulties in living were more important etiological factors. There may not be enough children of the right age, of the right sex, from the "right kind" of homes to play with. There may be too many children in the class; the teacher may seem too unjust to the particular child. He may not have won some special recognition in school, or he may have failed in some other way. All these extrafamilial conditions and events may be *there* and not only in the defensive imagination of the parents. But close study often, if not usually, reveals that the child's reaction to such events outside the home may still appear excessive, if not partially provoked by the child's own attitudes and personality which he brought to them.

I have been speaking still rather generally, perhaps, about the topic of etiology. Still, in a sense the general principles of etiology of persistent, and rather severe, emotional disorder in childhood of whatever form are no different from those of disorders and diseases which are the result of impersonal factors, that is, of infections, trauma and so forth. In other words, there is no single event or factor which *inevitably* determines the occurrence of a given disorder any more than a given bacterial organism, specific trauma or other non-personal factor always and by itself determines a given sequel in a recognizable organic disease syndrome. Just as a certain quantitative relation between some degree of susceptibility of the organism at a given period of its life and the virulence of the assault upon it of the specific external, environmental factor — bacterium, virus, trauma or whatever — is necessary to produce that reaction of the organism we know as organic disease; so it is with psychiatric emotional disorder. It is the *intensity* of the external interpersonal influences, and the *duration* of their operation as well as the *age* or *maturational phase* of the human organism during which it experiences them which in various combinations *together* produce what one writer has called the *"anthropological" variations,*[2] those personality organizations which the rest of us feel and consider as different from ourselves and then call them neurotic, psychotic, psychopathic or just "a bit queer" and write about as "problem children."

This general etiological principle of the period of life, the intensity and duration of the disturbing influences needs perhaps still another word of elaboration. The greatest susceptibility to emotional disturbance is clearly the period of greatest biological and social dependence or helplessness—namely, infancy and early childhood. That period of complete inability to survive and grow without the care and protection of adults is also—contrary to the opinion of many people—the period when conflict and anxiety, tension and uncertainty in the parental or mothering persons have the most disturbing effect. There is now fairly well validated evidence that uneasiness in the mother has a prompt and often severe effect upon the infant's well-being. Because it cannot yet speak and tell us in so many words, it is difficult sometimes to believe that the newborn, the infant or the very young child under one or two years of age can really sense and react to the hidden feelings of its parents who seem so very eager for its welfare. Nevertheless, the various disorders of its physiological functions, from gastrointestinal upsets, skin disorders to irritability and that frequently fatal apathy of marasmus are its way of telling the adult world how it feels it is being treated. I am sure that many, if not all, of you are familiar with these infantile disorders from such writers as Ribble,[4] Spock,[5] Aldrich,[1] and many others. Hence I shall not go into the details. How the tensions of the mothering person, whether in the nursery or the obstetrical ward, or later in the home or elsewhere, are communicated to what seems a still mindless creature, who tends towards sleepy withdrawal except when hungry or cold or on uncertain support is a mystery only to the unobservant. Those who see, sense and grasp how the mother, who struggles against her own more or less unknown but unpleasant and disagreeable impulses towards her child, handles it—either very gingerly, clutching it too tightly or too loosely, and reacts with even greater vacillation to its every whimper, and so on—are not at all mystified at this emotional empathic linkage, as Harry Stack Sullivan[6] calls it, between mother and child. You will notice that I said "those who see, sense and grasp" because if we listen to the mother's story of it we will hear often no word of her subjective state; at most we will hear only her emphatic insistence how careful she has been. She may be able to speak of her worry, of her anxiety only if she becomes convinced we are sympathetic and not likely to blame or minimize, or deride her feelings about not being an adequate and a good mother. Often we are unable to hear from her any confirmation of our suspicions as to her subjective state in the first or even several interviews. Instead we may hear insistent demands to tell her what is wrong with the child, what should be done for it and so on. If we even gently ask for some details about what happens at times when she feeds it, changes diapers or on other similar occasions, we may evoke an indignantly angry reaction to the effect that *that* has nothing to do with it, that she knows nothing about it, that she follows every detail of the rules of care given her, and, besides, aren't we the doctors and cannot we tell what is wrong by examining the child?

Such reactions of defensive resentment often make the doctor uncertain, uneasy about his hypothesis and half angry at himself and at the mother. If, on the other hand, the mother is the sort who tells more freely what *she* feels, she may finally weep and otherwise be so upset *and ashamed of it* that the doctor may be again embarrassed and feel somewhat helpless at the emotional storm on his hands. In any case, even if the mother's emotional state *is* obvious and perhaps obviously related to the condition of the child, what can one do about it? Often some soothing words, a sedative for the mother or child, or some change in formula or in some other detail of regimen ends the particular episode for the particular doctor who may or may not hear that the child has been taken on subsequent occasions to other, perhaps many other, doctors.

Whatever the factors in her present and past life which contribute to the mother's anxiety in the first year or the first two years of the child's life, they may or may not be sufficiently ameliorated so that the child does or does not experience recurrently or persistently an extremely disagreeable tension within himself when in contact with the anxious mother. If the mother's anxiety is not relieved or ameliorated by what the doctor does or by some change in her life situation or both, it is easy then to see why the child at two or three years of age or later shows some disturbance in emotional and interpersonal development. In general, the more intense the anxiety of the mother—and usually also of the father—the *earlier* in his life and the *longer* the child experiences it, the more severe his personality disorder later and the more likely is he as an adolescent or adult to react with crippling emotional illness to even minor thwartings. The specific exaggerations of interpersonal behavior, the symptoms of the disorder, whether of the neurotically inhibited variety, or of some disturbance in acquiring self-control of egocentric impulses, or of both, depends on the particular rigidities or vacillations of the parental attitudes. The child usually, if not always, mirrors the personality problems of the parents; his symptoms and his behavior reflect how he has been treated, which generally also reflects how the parents treat themselves. This is a generalization which may be difficult to confirm in any given clinical instance only if we do not spend an equal amount of time, patience and skill in learning to know the parents as well as the problem child, or if we prefer some theory about obscure genetic, constitutional factors, and disease of the brain and glands as being the preeminently important determinants of deviations of personality development.

This very brief review of etiology brings us to the problem of therapy. Therapy by the specialists generally consists of talking, of interviews with one or both parents *and* with the child, unless he is between two and a half and seven or eight years of age, in which case the therapist and child spend their time together in a play room. Whether the frequency of the meetings between the child and his therapist and those between the parent or parents and their therapists are the same, or whether the child is himself the object of most or of all the therapeutic attention, varies. In private treatment (especially psychoanalytic treatment) the child may have roughly one-hour sessions several times a week for months with the child analyst while one or both parents are in psychoanalytic treatment with other analysts, or are seen in occasional conferences with the psychoanalyst of the child. In many, if not perhaps in most, psychiatric out-patient clinics for children, in which the therapeutic staff may not have been trained psychoanalytically, the traditional division of labor is that the psychiatrist sees the child in the playroom or office in which there are such toys as dolls, doll furniture, crayons and paper, plasticene, finger paints and so forth, while the clinic psychiatric social worker sees the parent, most often the mother, in interviews. The sessions in such clinics are usually less frequent than in psychoanalytical treatment, generally about once a week. There are, here and there, some differences of practice. In some clinics the clinical psychologist—the third member of the professional clinical team—may also engage in some therapeutic interviews in addition to his traditional, clinical job of psychometric and other diagnostic testing. In other clinics, if the staff has more than one psychiatrist and they are trained for psychotherapy, the child and parent may be both treated by psychiatrists. This is especially true if the problem is severe. There is still considerable debate in this field as to whether the interviews with the parent are an essential part of the therapy, especially when conducted by a social worker, or are especially then to be called "casework." In a few instances one hears of efforts by one and the same therapist — especially in private practice — to see therapeutically both the child and parents—at different times, of course.

I hardly know whether to include some institutional types of attention to problem children as therapeutic in the strict sense. Various homes and special schools, especially when small and operated privately, give some domiciliary care and training to children with various emotional and/or intellectual handicaps. Hospital wards for children, residential treatment centers, must also be mentioned under children's psychiatric facilities, although they may vary in their theoretical orientation and hence in forms of therapy. Hospital wards for children are either parts of urban psychiatric hospitals, often teaching and research institutions, such as the ward at Bellevue Hospital in New York, at the Illinois Neuropsychiatric Institute in Chicago, or at the Langley Porter Clinic in San Francisco, or are special units on state hospital grounds such as at Camarillo and Napa State Hospitals in California. Whether the parents also receive therapeutic attention from the staff of such institutions depends upon many factors, such as the size and training of the staff, the number of children that must be cared for and the possibility of parents being able to come regularly enough and frequently enough to the hospital.

If we leave out of discussion the insulin, electroshock therapies with which I have no experience in the case of children's disorders—although I understand they are performed in various places—we may very briefly review the principles of psychotherapeutic work in child psychiatry. I say psychotherapeutic because the so-called "play therapy" is perhaps also more properly called psychotherapy. As one of my colleagues[2] once wrote, many people play with children, but they do not for this reason do any therapy. Play is for the child merely a partial substitute for speech in the child-psychotherapist emotional interaction and communication. A child, when sufficiently eased, in time, of his uncomfortable feelings in the presence of the trained adult therapist, may express some of his conflicting attitudes in play more spontaneously than in speech, just as the adult may be more able to do it in what is technically known as "free-association." In either case, whether with adult or child, with speech or with both speech and play as the mode of preferred communication between them, the patient and therapist begin what hopefully develops into an emotionally significant relationship. If this does develop—and whether it does or not depends upon many factors such as the frequency of the meetings, the duration of the therapy and, not least, the special training, skill and capacity of the therapist to understand the feelings and conflicts of children—if it does develop, there is then some chance that the child may begin to *feel* differently about himself, first in the presence of, and in relation to, his therapist, and later more generally with, and in relation to, most other persons in his life. This different feeling about himself in favorable or more successful instances is in the direction of sturdier self-respect, more realistic and more tolerant self-esteem for his actual assets and limitations, greater capacity to permit himself to *feel* whatever he feels in any situation but with a greater discrimination and greater fairness to himself and to others as to how he will express these feelings in action. In short, one hopes for at least some reduction—if not resolution—of his conflicts and self-destructive impulsiveness.

The details of the mutual work of both patient and therapist and of such phenomena as the "transference" which may eventuate in some such result cannot be dealt with cursorily. I wish, however, briefly to add a word about my own theoretical and practical inclinations with respect to the contribution of the therapy of parents to this possible therapeutic result in the child's feelings, attitudes and behavior. What seems to be clear to me both theoretically from what I have said previously and validated in a large measure in my own clinical experience is the following: As I have emphasized already, children, although individual human beings, are inevitably at the same time members of the family, their own biological family or another socially more or less their own. They are, in more impersonal terms, partially autonomous, component units of a larger, an organic system or unity. I think there is sufficient evidence also to say that the kind of persons or social entities they are or become results in a great measure from this fact. I find it convenient and useful, therefore, to consider their behavior, feelings and attitudes—their personality organization, in other words—as expressive of the kind of family social unit or system of which they are a part. To repeat what I said previously, the way they feel and act reflects how they have been treated by the adult persons who care for them. How these persons have treated them expresses or reflects how these adults basically feel towards themselves. Hence, an emotionally disturbed child to me indicates unhappy parents in the same way that a sick organ indicates or expresses a sickness of some sort or degree of the entire organism. In the case of the sick organism we know as physicians that it may not be enough — if it ever is — to treat only the sick organ. As a matter of fact, in more and more diseases we are learning that treating the entire organism is often more important than the sick organ, and now and again the most direct way towards restoration to health of this sick organ.

I am sure I need not labor the analogy further. If you review your own clinical experience from this point of view, I am rather confident you will find confirmation for the statement that helping a parent or *the family as a whole* to greater happiness, integration, mental health or however you wish to term it, is often an important and at times the most direct way to help an unhappy child. I must add immediately two things: First, we may at a certain juncture in the life of another person be unable either to do much or to do anything at all to help him feel and live more contentedly; and, second, to say that helping a parent is important does *not* mean that direct help to the child is unimportant or unnecessary. It is —as in the case of the organism with an obviously very sick organ—a matter of flexible, clinical judgment, of available therapeutic armamentarium, of time, of severity of disturbance in all parts of the system, and of the easiest avenue of approach. In terms of the family with a problem child, it is his age, the severity and chronicity of his disorder, as well as the therapeutic availability of his mother, father or their substitutes, and the time, skill and personnel which together determine whether all three will receive therapeutic attention, or only two or one of them.

What constitutes "therapeutic availability" needs another bit of explanation. I mean by this term not merely whether the father as well as the mother, in addition to the child, have the time and there is some financial possibility of giving each of them some therapist's time, but even more important, whether any one, two or all three of them are basically more or less ready and more or less *willing* even to begin to work out their individual and therefore common problems and conflicts with a therapist.

In any case, it is certain that any change, whether towards integration or the obverse in any component part or member of the familial social system will affect other parts or members or the entire unity. And this is what we see clinically in child and father if mother only is helped to feel a more solid self-esteem or in any other combination. Clearly, if both the parent or parents as well as the child can be given assistance simultaneously, there is — other things, such as therapeutic skill and time, being equal—greater chance of quicker or more thorough therapeutic results. By the same token, the more severe the disorder, the more likely is some positive therapeutic result to follow the more total treatment of the entire family.

REFERENCES

1. Aldrich, C. A. and M. M.: Babies Are Human Beings, New York, Macmillan Co., 1938.

2. Erikson, E. H.: Observations on Sioux education, J. Psychol., 7:101-156, Jan. 1939, especially page 133.

3. Gitelson, M.: Direct psychotherapy of children, Arch. Neurol. and Psychiat., 43:1208-1223, June 1940.

4. Ribble, M.: The Rights of Infants, New York, Columbia Univ. Press, 1943.

5. Spock, B., & Huschka, Mabel: Psychological Aspects of Pediatric Practice, Pract. Libr. Med. & Surg., 13:757-808, New York, Appleton-Century Co., 1938.

6. Sullivan, H. S.: Conceptions of modern psychiatry, Psychiatry, 3:8-9, Feb. 1940.

7. Sullivan, H. S.: Therapeutic investigations in schizophrenia, Psychiatry, 10:124, May 1947.

Epinephrine Hand Nebulizer in Asthma

Technique of Use, Clinical Aspects

A. M. Targow, Ph.D., M.D., *Los Angeles*

SUMMARY

It behooves the physician seeking relief for asthmatic patients not to be casual about the epinephrine hand nebulizer and the manner in which it is used. Patients who claim to get no relief from the nebulizer should be asked to demonstrate their technique. If the nebulizer produces a hardly visible mist, it should be discarded. For many patients, the goal in spraying by hand must be the production of more or less continuous and voluminous aerosol, regardless of the phase of respiration, in order to effect relief. If the respiratory pattern has not deviated too far from normal in rate and depth, inhalations may be carried out in courses or cycles of about a half-minute duration and spaced a few minutes apart. If the respiratory pattern is abnormal during the act of spraying, it must be corrected.

Inhaled epinephrine aerosols as constituted today appear to be somewhat irritating to the mouth, throat, and upper portion of the pulmonary tract of some persons, but it has not been convincingly demonstrated that serious and permanent damage to the lower respiratory tract of humans can occur from long-continued use of inhaled epinephrine.

Although the general procedure involved in using the epinephrine hand nebulizer is readily grasped by the average patient, the actual performance in many instances leaves much to be desired. Physicians for the most part assume that patients will acquire proficiency either from experience or from the printed directions accompanying the instruments when purchased. However, the latter source of information is frequently far from adequate and most patients are fearful of self-experiment with such a potent drug. The result is that many an asthmatic patient fails to obtain relief solely because of poor technique, a fact pointed out by one of the popularizers[5] of this method of therapy. Despite this situation, no detailed discussion of the technique of use of the hand nebulizer has appeared in the literature.

Recent interest on the part of investigators in the development of other devices[8, 9, 14] for producing inhalant materials may possibly soon lead to obsolescence of the epinephrine hand bulb nebulizer. Until such time as this occurs the present communication may prove to be helpful to the practitioner who sees only an occasional asthmatic patient and may therefore not be aware that pitfalls in the technique of use of the hand nebulizer can unnecessarily rob certain patients of relief.

What follows does not apply either to patients in status asthmaticus or to those who respond so readily to one or two inhalations that they absorb an adequate amount no matter how they use the nebulizer. It pertains rather to a considerable group of patients who fall between these two extremes, who are generally ambulatory but subject to asthmatic seizures of moderate to severe intensity and of variable frequency, and in whom the difference between success and failure in obtaining relief by inhalation depends on inhaling a certain minimal quantity within a relatively short period of time.

The commonest error committed by patients in this group is to attempt to synchronize inspiration with manual compression of the bulb. This error is furthered by the many vendors who sell the nebulizers packaged with their own particular trade name for what is essentially a 1:100 solution of epinephrine hydrochloride. Typical directions in such a package instruct the patient: "Hold the nebulizer outlet inside the mouth, and with mouth open squeeze the bulb while inhaling. Do not pump while exhaling. Only a few inhalations are necessary. If symptoms are not relieved in a few minutes, the inhalations may be repeated." What usually happens in following such directions is that the patient begins to inspire so far in advance of compression of the bulb that inspiration is almost completed before any epinephrine enters the lungs. For the patients under discussion here a larger intake than can ever be obtained by this method is necessary.

Since the aim of therapy is to produce relief, not to economize on epinephrine, it is advisable at all times to keep the mouth of the patient so full of the aerosol that the material can be readily sucked down into the lungs from the very beginning of inspiration. This can be accomplished only by rapidly repeated forcible compressions of the bulb, regardless of the phase of respiration. In this way, the conditions of constant flow obtained by attaching the nebulizer to an oxygen tank are approximated.

If the respiratory pattern has not deviated too far from normal in rate and depth, the patient may inhale a considerable number of times before he stops spraying. Comparative freedom from side-effects is one of the advantages offered by this route of ad-

---

From the Division of Allergy, Department of Medicine, University of Southern California School of Medicine, Los Angeles.

ministration. However, a method of minimizing inhalation of needless excess is to caution the patient not to inhale more than ten to twelve times, or for longer than a half minute at a time, then to wait for a few minutes to see what degree of relief will ensue before repeating the course of inhalations. As many as five or six successive half-minute courses, spaced a few minutes apart, may then be attempted before it can be concluded that relief by this method is not obtainable.

The degree of relief attained by this technique will be found to run a gamut from complete relief after a few initial inhalations to only partial relief or no relief even after six courses or more. For those who respond slowly, the later courses may bring about a greater degree of relief than the first or second, but the degree of relief is as a rule maximal after five or six periods of inhalation, so that if relief is at this time only partial or absent, further spraying is generally useless for the time being.

Many patients unconsciously alter their breathing pattern when nebulizing. Some, on the one hand, will exaggerate both rate and depth of respiration. Patients in this group who cannot be taught to approximate the normal must be cautioned to restrict themselves to no more than three or four exaggerated respiratory excursions at a time during each course lest symptoms of hyperventilation develop. Other patients, on the other hand, will unaccountably diminish respiratory excursions to a notable shallowness, almost holding the breath while spraying. Patients in this group should be taught either to convert to a normal rate and depth or to adopt the pattern of a few forced, exaggerated respirations per spraying cycle as in the preceding group.

Some persons find it almost impossible at first to avoid synchronizing nebulization with inspiration. They apparently lack a ready facility to carry on a hand compression of the bulb as a separate act by itself at a rate different from the respiratory rate. In these circumstances it is best for some other member of the family to work the hand bulb until such time as the patient can learn to do this properly for himself.

FAULTY INSTRUMENTS

In spite of close attention to the preceding details relative to the respiratory pattern, failure may yet ensue if the nebulizer is not an efficient one. It is unfortunate that one instrument which is designated as a vaporizer and is widely sold today under the name of a nationally known pharmaceutical house delivers a mist so meager in volume that a high percentage of patients, in the author's experience, fail to obtain relief with it. This is in accord with the similar experience of Harsh[7] with this instrument. Patients using this model who are certain they cannot obtain relief from inhaled epinephrine are agreeably suprised with results obtained with a nebulizer producing a more voluminous mist.

EFFECT ON MUCOSA

Since what is being advocated here is the liberal use of nebulized epinephrine during an asthmatic paroxysm to ensure that maximum benefit may be attained, the question of injury to the respiratory mucosa arises.

Injury has been experimentally produced in animals by long-continued exposure to epinephrine mist. Fox[3] sprayed rabbits intranasally with a 1:1,000 solution of epinephrine hydrochloride over a three-month period and on sectioning the maxilloturbinates found that the mucosa showed increased leukocytic infiltration with formation of intraepithelial abscesses and areas of denudation of the epithelium. Galgiani[4] and co-workers used the 1:100 dilution as a spray for a few months in cats and rabbits. In some of the animals, but not all, loss of tracheal cilia and desquamation of the tracheal and bronchial epithelium with inflammatory changes in the sub-mucosa were noted. In one human subject moribund from tuberculosis and subjected to frequent spraying in the 48-hour period before death, similar changes were demonstrable postmortem and were attributed to the epinephrine.

It is curious, however, that despite widespread use of the nebulizer since its popularization[6, 11] some years ago, severe injury of the lower respiratory tract due to frequent inhalation has not been reported in humans save very recently by Benson and Perlman.[2] These observers reported a few cases in which they felt that death had been caused by excessive use of 1:100 epinephrine for relief of asthma. They postulated a sequence of events in these instances whereby damage to the respiratory mucosa became severe enough to lead to infection with subsequent formation of occluding plugs, anoxia, and death. Unfortunately for their thesis, and as the authors themselves admit, the pathological changes they describe (loss of cilia, epithelial metaplasia and desquamation, cellular infiltration of the subepithelial layers) were described at postmortem examination of asthmatics before the era of epinephrine inhalation. To ascribe these changes to epinephrine and to claim an increased mortality therefrom is at variance with the experience of observers [5, 12, 13] who have administered aerosolized epinephrine to innumerable patients without any seeming ill effects, or at any rate without any effects that have hitherto been ascribed to inhalation therapy. Benson and Perlman believe that the pulmonary changes in question constitute a pattern of injury reproducible by any irritant and the occurrence of this pattern in asthmatic patients before the widespread use of epinephrine inhalation cannot discredit the role of the drug in the production of such changes also.

It cannot be denied that some degree of irritation does occur in the mouth and throat in a fairly high percentage of patients.[5,6,10] Patients frequently complain of dryness and/or burning in the throat area following even short-time use of the spray. Transient mild irritation of the lower bronchial tree may also be a factor in the initial increase in coughing which follows immediately after inhalation in many instances, and which is quite helpful in dislodging and bringing up mucus. (It should be kept in mind, however, that later bouts of coughing may be due to stimulation of sensory nerve endings by loosened plugs of mucus. It is well, incidentally, to caution patients that a pinkish stain which may appear in material that is coughed up is due to oxidation of the epinephrine and not, as many frightened patients assume, to blood. The possibility of hemoptysis must nevertheless always be kept in mind and in case of doubt appropriate procedures instituted to ascertain the nature of the stain.)

MINIMIZING IRRITATION

One simple method of minimizing irritation is to direct the patient to rinse the mouth after each session of spraying.[6] Lockey[10] pointed out that irritation may also be minimized by adding glycerine to the epinephrine solution to a final concentration of 5 per cent. Other advantages accruing from glycerine, such as stabilization of the particle size of the mist, have been pointed out by Abramson,[1] who favors a 25 per cent concentration, and concurred in by Harsh[7] who pointed out still further advantages such as a bacteriostatic and a wetting effect.

In most instances any irritation produced by the aerosol is transient and subsides either because the interval between asthmatic seizures is sufficiently long, or because the average patient with localized symptoms of any severity will desist from further use of the nebulizer until the symptoms have disappeared. There is thus a distinct difference between humans who naturally bring their defense mechanisms into play and animals who are not permitted to do so, as in the experiments mentioned. Also, species and individual differences may be of importance, since every allergist encounters patients who use unbelievably large quantities of epinephrine by inhalation and by injection daily for months and years without any apparent ill effects.

In certain instances, however, asthma is persistent enough, and severe enough, so that the temptation to continued use despite symptoms of irritation is overwhelming. It is in these instances that the possibility may arise of serious damage to the lower respiratory tract from long-continued inhalation. In such circumstances, if the nebulizer is only minimally effective it may be simple enough to prohibit its use and substitute other measures of equal or greater efficacy. Some patients in fact learn by experience that the spray suffices only for the milder attacks and automatically discard it for other measures for the more severe attacks.

The advantages of this method of therapy are ease of application, quickness of response, comparative freedom from side-reactions, and, to a degree depending on the severity of the asthma, comparative freedom from home confinement by reason of portability of the nebulizer. Many a patient's life has been made bearable through the use of this simple contrivance. Given such a situation—but provided, of course, that similar relief cannot be obtained in any other way—the propriety of denying to the patient the benefits of inhaled epinephrine is open to question. One must look askance at a logic which attaches utmost importance to protection of the respiratory tract from possible permanent damage which might accrue over a long period of time and precludes all consideration of the patient's general comfort and well-being from day to day. In this connection the recently expressed opinion of an asthmatic patient who is himself a physician[15] is illuminating: "Not being able to see my bronchial mucosa I am not worried about [the effect of the spray on] its possible thickness or the inactivity of its cilia. I am, however, able to carry out a full day's work. . . . If my life has been shortened by using adrenaline sprays, at least I shall have had more hours of useful activity on earth than I should otherwise have had."

It would seem, then, that with respect to this problem of long continued use of the hand nebulizer there is at present no substitute for the exercise of judgment by the physician in each individual instance. One comes thus to the same conclusion as did Galgiani[4] and his co-workers who despite the results of their animal experimentation and despite being convinced that considerable local damage may result stated: "The clinician would therefore seem to be under the necessity of deciding in each individual case whether the gain in convenience of medication by inhalation is great enough to justify the possible production of added pathologic changes."

OTHER DISADVANTAGES OF USE OF HAND NEBULIZER

It is necessary to point out that damage to the respiratory tract is not the only objection that can be advanced against the use of the nebulizer. There is a measure of correctness in the view held by some allergists that if an asthmatic patient gets satisfactory relief by this method without ever having gone to a physician, or shortly after he is introduced to this technique by a physician, he may stay away from medical observation and thus the cause of the asthma may never be determined. This possibility is enhanced by the present widespread and unregulated over-the-counter traffic in the sale of both nebulizers and solution. If the onset of asthma is in adult life, and symptoms remain moderate in degree without leading to organic changes in the cardiopulmonary apparatus, the matter may be of no consequence. In the case of a child, however, failure to seek proper medical care may lead to undesirable consequences.

It is true, furthermore, that some patients use the nebulizer with unncessary frequency, at the slightest sensation of "pressure" or "heaviness" in the chest, without waiting to see whether or not their symptoms will subside. Such patients may build up a neurotic dependence upon having the nebulizer ever at hand. Illustrative of an interesting psychosomatic aspect of asthma, it is conceivable that a few individuals in this group may at times develop asthma solely as a fear-conditioned reflex should they perchance unexpectedly find themselves without the nebulizer in their possession. Some physicians, for any or all of these reasons, refuse to allow their patients to use a nebulizer. But the solution of these problems should not lie in interdicting the use of the nebulizer by those who desperately need it merely because some may use it unwisely and without supervision.

6333 Wilshire Boulevard.

REFERENCES

1. Abramson, H. A.: Aerosol therapy of the lungs and bronchi with special reference to penicillin and hydrogen peroxide, Bull. New Eng. Med. Center, 8:97, June 1946.

2. Benson, R. L., and Perlman, F.: Clinical effects of epinephrine by inhalation, Jour. Allergy, 19:129, March 1948.

3. Fox, N.: The chronic effect of epinephrine and ephedrine on the nasal mucosa, Arch. Otolaryng., 13:73, Jan. 1931.

4. Galgiani, J. V., Proescher, F., Dock, W., and Tainter, M. L.: Local and systemic effects from inhalation of strong solutions of epinephrine, J.A.M.A., 112:1929, May 13, 1939.

5. Graeser, J. B.: Inhalation therapy of bronchial asthma, J.A.M.A., 112:1223, April 1, 1939.

6. Graeser, J. B., and Rowe, A. H.: Inhalation of epinephrine for the relief of asthmatic symptoms, J. Allergy, 6:415, July 1935.

7. Harsh, G. F.: A comparative study of commercial nebulizers, Annals of Allergy, 6:534, Sept.-Oct. 1948.

8. Krasno, L., Karp, M., and Rhoads, P. S.: Inhalation of penicillin dust, J.A.M.A., 138:344, Oct. 2, 1948.

9. Krasno, L. R., Grossman, M., and Ivy, A. C.: Norisodrine dust inhalation for asthma, Science, 108:476, Oct. 29, 1948.

10. Lockey, S. D.: Inhalation of oxygen and 1:100 epinephrine hydrochloride plus five per cent glycerin for the relief of asthmatic attacks, J. Allergy, 14:382, July 1943.

11. Matzger, E.: Epinephrine by inhalation for the relief of attacks of bronchial asthma, Calif. & West. Med., 43:226, Sept. 1935.

12. Richards, D. W., Barach, A. L., and Cromwell, H. A.: Use of vaporized bronchodilator solutions in asthma and emphysema, Amer. Jour. Med. Sci., 199:225, Feb. 1940.

13. Segal, M. S.: J. Allergy, 19:278, July 1948.

14. Taplin, G. V., and Bryan, F. A.: The use of micronized therapeutic agents by inhalation, Annals of Allergy, 6:42, Jan.-Feb. 1948.

15. Wingate, P.: Asthma and the inhaler, Brit. Med. J., 1:226, Jan. 31, 1948.

CASE REPORTS

Coccidioidomycosis of the Genital Tract

Henry M. Weyrauch, M.D., Frank W. Norman, M.D.,
and J. Brandon Bassett, M.D., *San Francisco*

Two patients who had a rare type of fungus infection of the genital tract were observed recently. As nearly as can be determined there are no previous reports of cases in which an isolated genital lesion was the only indication of metastasis of coccidioidal infection.

In one of the two cases, an incorrect diagnosis of tuberculous epididymitis had been made previously. Although microscopic examination of tissue removed at operation elsewhere had shown lesions which had been thought to be tuberculous, the subsequent isolation of Coccididoides immitis revealed the true cause. In the second case, the diagnosis of coccidioidomycosis was made on the basis of the history and serological tests prior to operation.

The term "coccidioidomycosis" should not be confused with "coccidiosis." The former refers to infection caused by the fungus Coccidioides immitis. "Coccidiosis" refers to an infection by a sporozoan parasite under the order Coccidia which affects mainly poultry and small animals.[2]

CASE REPORTS

Case 1: The patient, a white male 42 years of age, entered the hospital December 31, 1947, complaining of an open wound in the right inguinal region. Four months previously he had noted a painless swelling at the lower pole of the right testicle. The swelling had gradually enlarged and become acutely painful. After parenteral administration of penicillin, the swelling and pain had subsided. Because the epididymis remained indurated, however, the right testicle had been explored six weeks prior to admission to the Veterans Administration Hospital. At that time the affected testis and epididymis had been removed. Results of pathologic examination had been reported to indicate tuberculosis of the epididymis.

The wound had healed superficially, but remained indurated. and three weeks after operation it separated along the line of incision, and a granulomatous process developed in the surrounding skin and subcutaneous tissues. During the three weeks before the patient came under the care of the authors, the wound had shown no signs of healing.

The patient's home was in Los Angeles, and he had traveled extensively throughout Southern California during the previous 16 years. Seventeen months prior to the onset of illness, he had made a two-day hunting trip to Taft in Kern County. Within ten days after the trip, acute illness, which was manifested by chills, fever, headache and pains in the chest, developed. The diagnosis was pneumonia, and the patient remained in bed for ten days. Treatment consisted of parenteral administration of penicillin. The symptoms gradually subsided and within a month the patient had apparently regained normal good health.

On the patient's admission to the Veterans Administration Hospital, the temperature was persistently elevated to 100° F. The right scrotal and inguinal areas were occupied by a granulating mass about 6 cm. in diameter. There was deep induration, and fluctuation was elicited around the stump of the spermatic cord, felt in the upper portion of the scrotum. The area of fluctuation extended high into the inguinal region. The left testis, epididymis, and spermatic cord, both seminal vesicles and prostate were normal to palpation. The prostatic secretion was microscopically normal. The remainder of the physical examination did not reveal abnormal findings.

A differential leukocyte count showed eosinophilia (5 per cent eosinophils) but was otherwise normal. The sedimentation rate was 25 mm. in one hour (Westergren method). The urine did not contain pus cells, red blood cells, or bacteria. X-ray study of the chest showed a mass of soft tissue density, 2 cm. in diameter, in the region of the left hilum (Figure 1). The lung fields were otherwise clear. Intravenous urograms and skeletal roentgenograms were interpreted as being normal. Intradermal tests showed a sensitivity to tuberculin in dilutions of 1:1,000. Gastric washings and repeated cultures of the urine were negative for tubercle bacilli.

The clinical picture remained unchanged during a week of observation. The clinical impression was that the condition was pulmonary tuberculosis and tuberculosis of the stump of the right vas deferens with secondary infection and abscess formation. Incision and drainage of the fluctuant area in the right inguinal region, one week after the patient entered the hospital, yielded approximately 60 cc. of thick pus and caseous material. Generous portions of the granulomatous tissue were excised for biopsy, but no attempt was made to debride the wound completely. The edges were left widely separated with a packing of iodoform gauze.

Postoperatively the patient's temperature promptly returned to normal. There was little drainage from the wound (Figure 2).

A heavy growth of fungus was cultured from pus obtained at operation (Figure 3). Other forms of bacteria were not found on smear or culture. Pathologic examination of the granulomatous tissue showed spherules of Coccidioides in well-defined tubercles (Figure 4). The original sections of the epididymis were reexamined and spherules were not found, but on additional sections, coccidioidal endospores could be seen in abundance. Cultures of urine and spermatic fluid made shortly thereafter produced heavy growths of Coccidioides.

Arthrospores of cultured fungus were injected into the testes of guinea pigs and acute purulent orchitis developed; endospores were identified and recultured.

Serological tests* were made on the 23rd hospital day.

From the Department of Urology, the United States Veterans Administration Hospital, Fort Miley, San Francisco, and the Division of Urology, Department of Surgery, Stanford University Medical School, San Francisco.

Sponsored by the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are a result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

*By C. E. Smith, M.D.

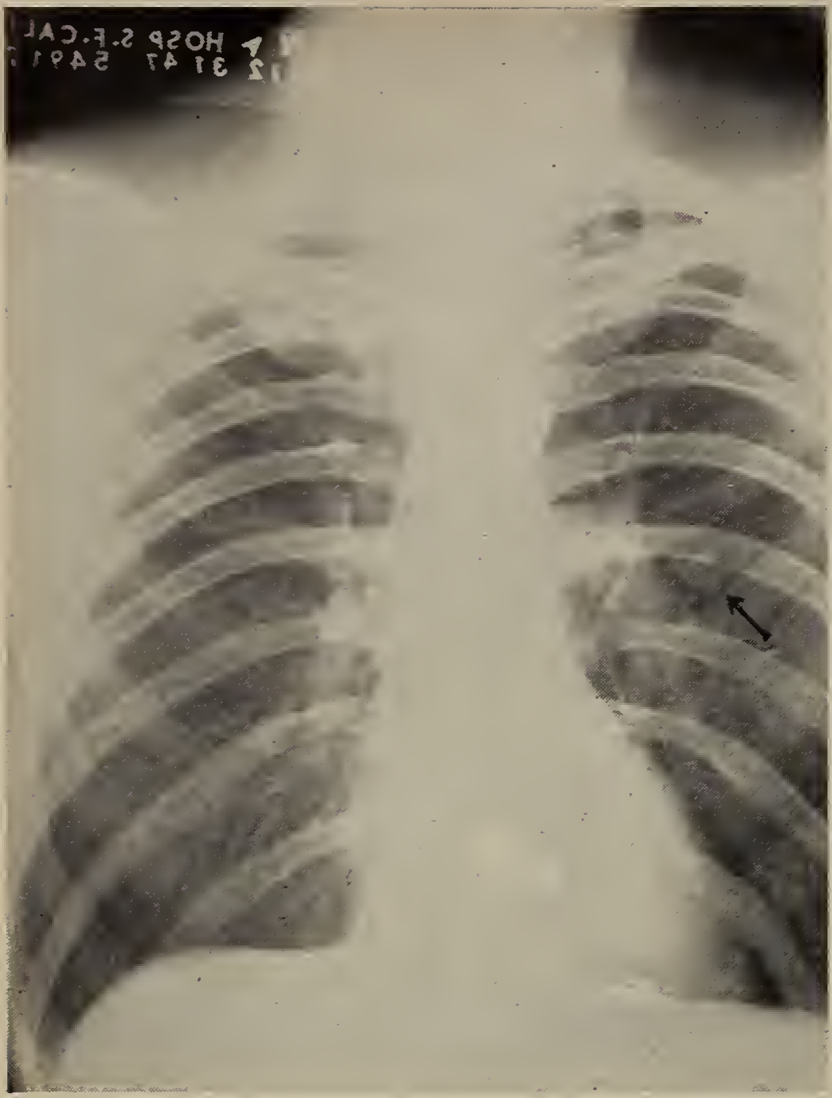


Figure 1.—X-ray film of chest. Arrow points to lesion in left parahilar area, considered to be the primary focus of the coccidioidomycosis.

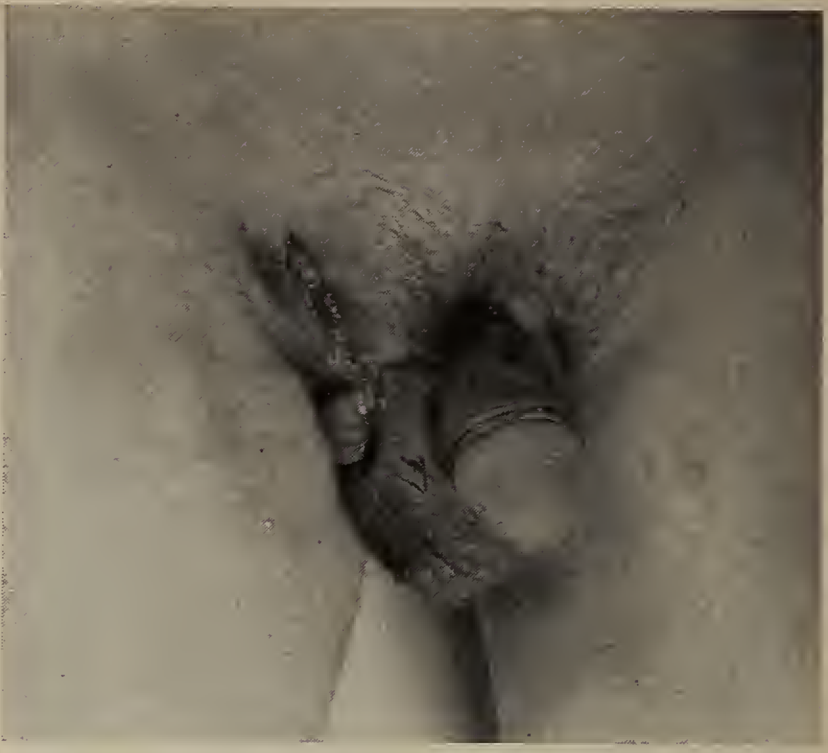


Figure 2. — Lesion in right inguinoscrotal area four weeks after incision and drainage.

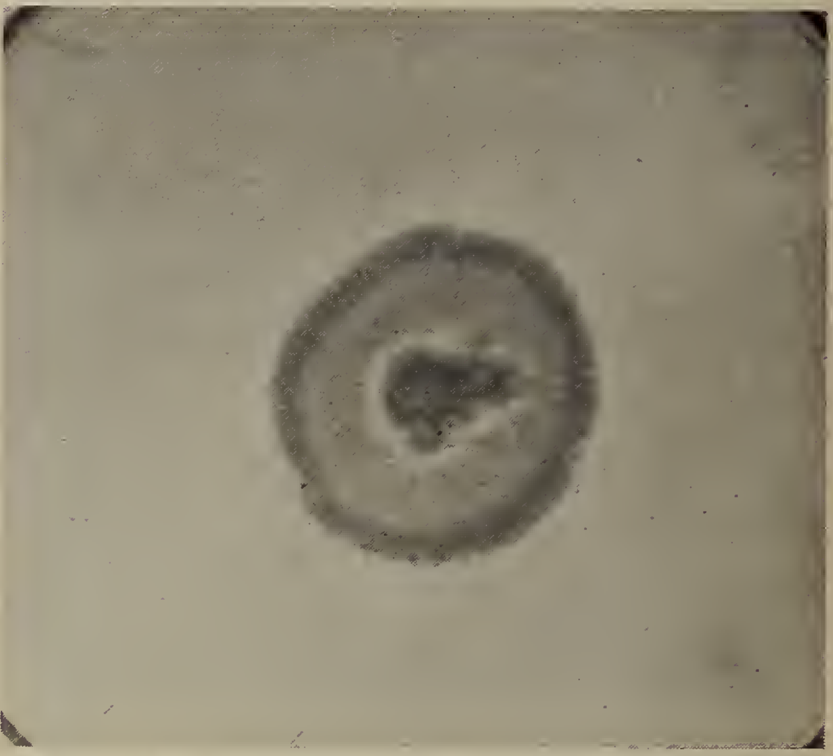


Figure 3.—Coccidioides immitis culture on Sabouraud's agar.

The result of a complement-fixation test for coccidioidal infection was strongly positive, whereas the precipitin test was negative. Intradermal injections of coccidioidin showed a slight sensitivity in dilutions of 1:10. The findings were interpreted as being compatible with a nonprogressive single metastatic lesion due to Coccidioides immitis and he considered that the low complement-fixation titer indicated a good prognosis.

Local application of tyrothricin ointment was the only additional treatment the patient received.

Thirty days after operation, the induration surrounding the wound had receded and the skin edges were beginning to grow in. Cultures of material from the wound still grew Coccidioides in great abundance. The patient was afebrile, ambulatory and gaining weight. The sedimentation rate had fallen to 4 mm. in one hour. A differential leukocyte count showed only 1 per cent eosinophils. There was no change in the results of serological tests.

The patient was discharged from the hospital two months after operation. By that time the wound had healed except for a small, granulating area, less than 1 cm. in diameter. Cultures of material from the wound, urine, and spermatic fluid still grew a few colonies of Coccidioides. On follow-up, 16 months later, the patient was in excellent health, but a few Coccidioides could be grown on culture of spermatic fluid. The wound was completely healed.

The patient is being observed at frequent intervals. Radical treatment, such as further operative procedures, is not planned unless indications arise. Although the growth of Coccidioides from the spermatic fluid indicates that the infection is still active in the genital tract, there are no obvious gross changes in the seminal vesicles, prostate, or remaining testis and epididymis. Encouraging evidences that the disease is limited are the healing of the wound, the gain in weight, a normal sedimentation rate, the negative reaction to precipitin test, the low titer of the positive complement-fixation test, and a normal blood count.

* * *

CASE 2: The patient, a 31-year-old white male, entered the hospital on October 28, 1948, complaining of enlargement of the left testicle for two years. Five years prior to entry, when he was in the Mojave Desert, a dry, nonproductive cough and low-grade fever had developed. After a diagnosis of pleurisy with effusion, thoracentesis was carried out repeatedly, but tubercle bacilli were not found. Result of a tuberculin skin test was positive, but an etiological diagnosis was not made.

Two years before admission the patient noted a sudden painful enlargement of the left side of the scrotum; this subsided within several weeks, leaving a residual non-tender swelling. The enlargement remained unchanged until 15 days prior to entry when the patient received a blow to the left testis. This was soon followed by a painful swelling and the occurrence of two openings over the left side of the scrotum, which drained a foul-smelling purulent material. Again the mass decreased to its former size, but drainage continued.

Physical examination at the time of admission to hospital was of interest only as concerned the genitalia. There was pronounced enlargement of the superior pole of the left epididymis with lesser enlargement of the inferior pole and adjacent testis. A fluctuant area which transmitted light lay anterior to the testicle. The surrounding scrotal skin was moderately indurated and the contents were fixed to the lateral scrotal skin at the site of two small fistulae. The vas deferens felt normal. The right testicle was normal. The prostate was of normal size, contour and consistency; the secretion was normal. The seminal vesicles were not palpable.

The urine was normal. The sedimentation rate was 32 mm. in one hour (Westergren). A differential leukocyte count showed 4 per cent eosinophils. Ejaculate culture was negative for Coccidioides. Serological tests for coccidioidal infection showed positive complement-fixation and negative reaction to precipitin tests. An x-ray film of the chest revealed no abnormalities. Reaction to a coccidioidin skin test was strongly positive. The result of a tuberculin skin test was negative.

Following a diagnosis of coccidioidomycosis of the left epididymis and testis, left epididymo-orchiectomy was performed. The entire testicle, adjacent spermatic cord, attached sinuses and skin were removed without opening the tunica vaginalis testis (Figure 5*A*). The vas deferens was separately ligated and implanted subcutaneously.

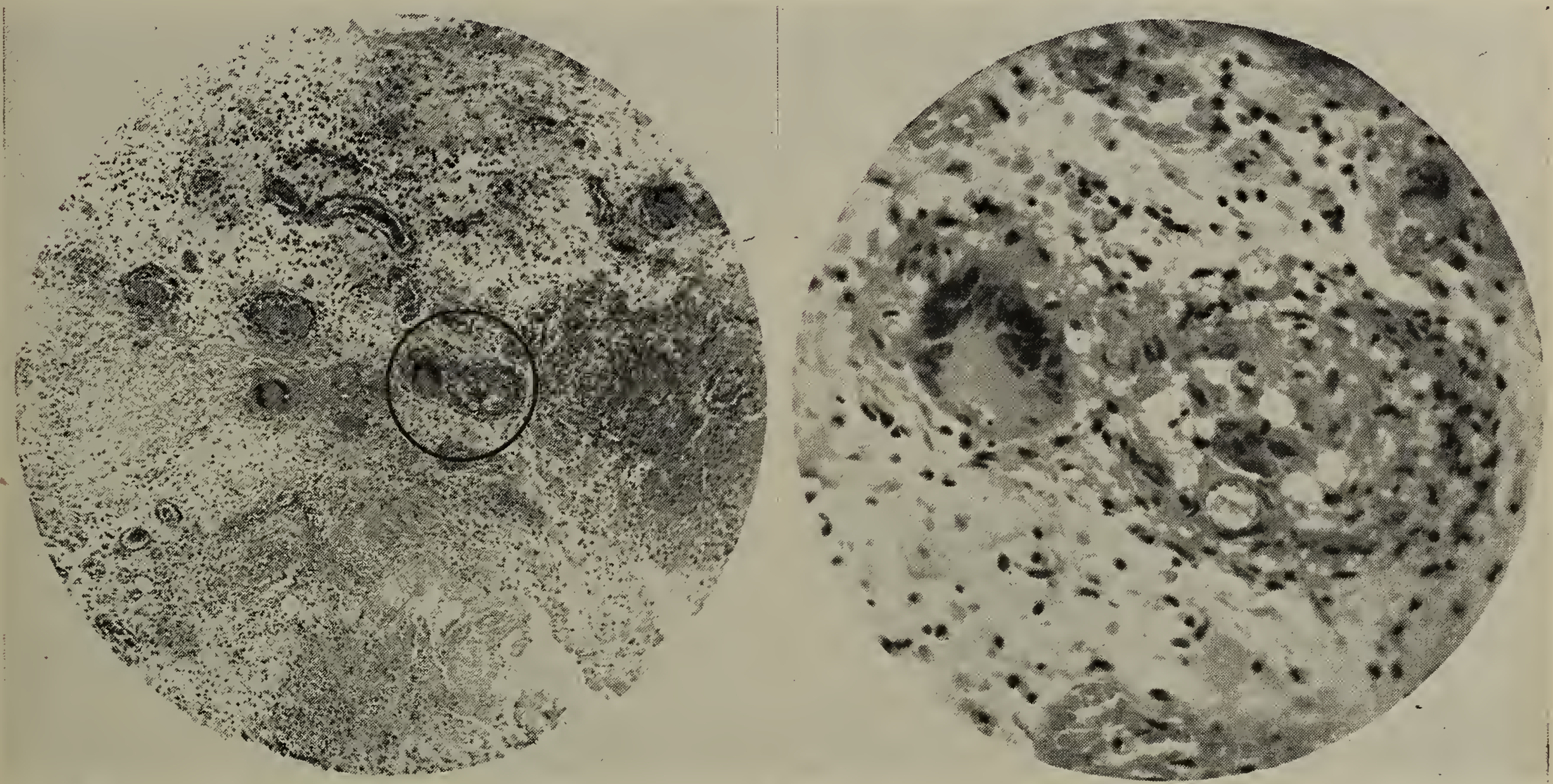


Figure 4.—*Left,* granulomatous lesion in the epididymis (Case 1). Note tubercles, giant cells, and caseation, closely resembling the microscopic picture of tuberculosis. *Right,* Characteristic spherule of Coccidioides immitis in tubercle with a multinucleated giant cell.

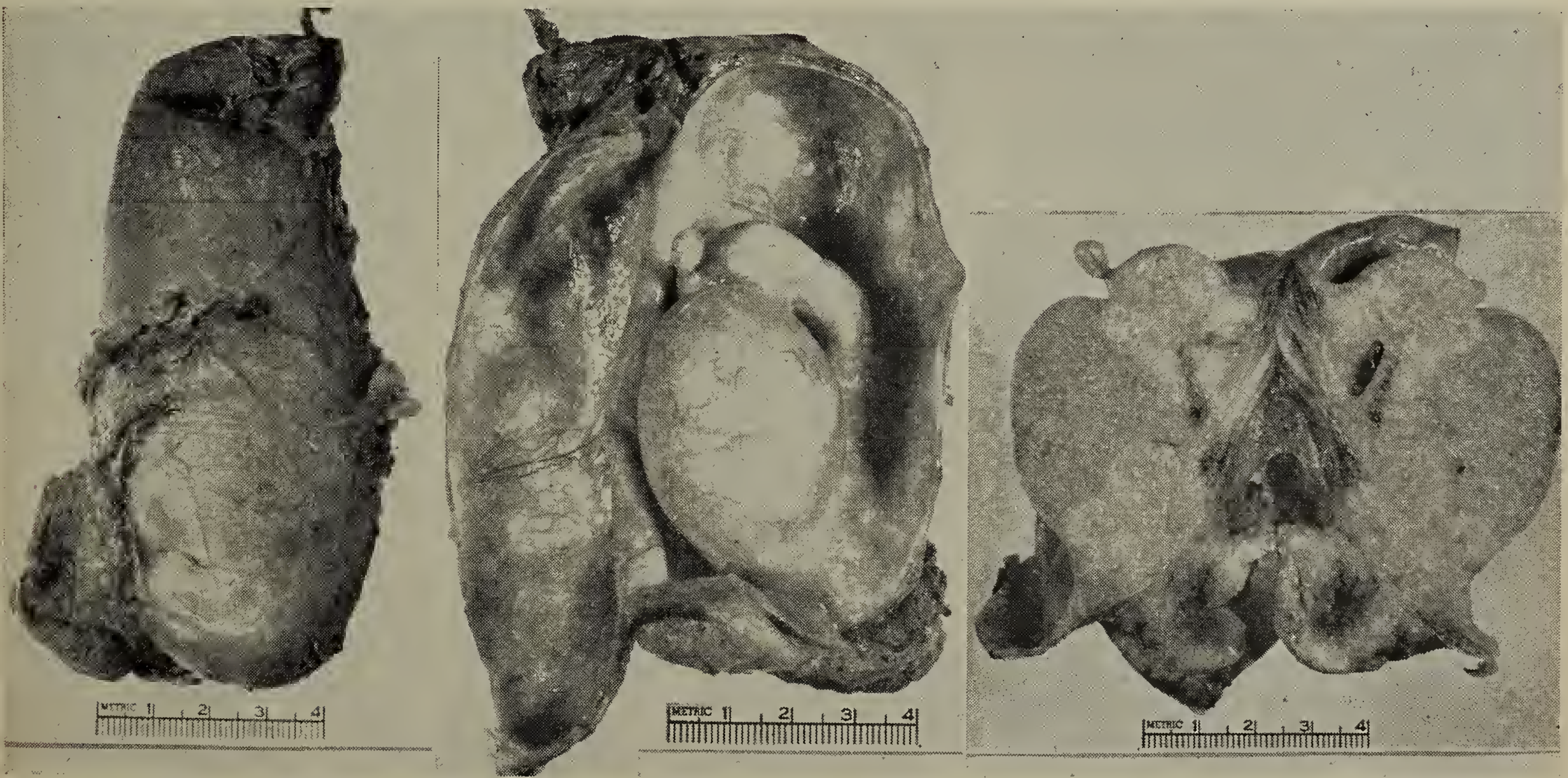


Figure 5.—*Left,* intact hydrocele and attached skin containing two small sinuses (Case 2). *Center,* opened tunica vaginalis. Note enlargement of globus major of epididymis and appendages. *Right,* diffuse granulomatous involvement of epididymis and testis as seen on section.

Pathological examination showed a smooth-lined hydrocele sac filled with brown fluid. The epididymis and testis were partially replaced by granulomatous material (Figure 5). On microscopic examination, a chronic granulomatous process containing many double-contoured refractile bodies of Coccidioides immitis was found.

The postoperative convalescence was uneventful, and the wound healed rapidly by primary intention. Subsequent serological tests for coccidioidal infection showed a fall in titers coinciding with extirpation of the only proved metastatic coccidioidal lesion.

DISCUSSION

It is generally accepted that the initial infection in coccidioidomycosis occurs when arthrospores of the fungus are inhaled from dust and establish a primary lesion in the lung. At this site the organisms may be walled off, as in primary tuberculous infection, or lead to generalized dissemination. Dissemination takes place soon after or coincident with the primary infection, but occurs in only about 1 per cent of clinically manifest infections in white males. Dissemination is more frequent in dark-skinned races.[3]

Forbus and Bestebreurtje[1] reported the distribution of lesions found on necropsy in 50 cases of disseminated coccidioidomycosis. In 60 per cent of these cases, gross renal lesions were evident. In only 6 per cent were lesions found in the prostate, and these were evident only on microscopic examination. Lesions were not observed in any other organ of the urogenital system.

Since dissemination generally occurs within three to six months after the initial infection, the first of the two cases here reported is unusual in that evidences of genital involvement did not appear until after a latent period of 17 months. The second case is remarkable in that the genital infection must have been dormant for two years before the patient sought medical treatment of the scrotal swelling.

The disease is known to be extremely infectious when human beings or animals are exposed to the arthrospores from infected culture plates or dust, but as far as is known the disease is not transmitted from person to person, and isolation is thought to be unnecessary.

The cases reported here suggest the possibility of intraperitoneal implantation of coccidioidal endospores. Since the ejaculate in the first case was heavily contaminated, the question arises whether infectious material could be carried into the peritoneal cavity of the female by spermatozoa after sexual intercourse and there find a suitable habitat for growth. However, this is unlikely because the disease cannot be transmitted in the endospore stage. Unfortunately, the first patient's wife refused examination because of religious tenets. The wife of the second patient was tested, despite the fact that Coccidioides was not cultured in the husband's ejaculate. Results of a skin test were negative and an x-ray film of the chest showed no abnormality.

The present treatment of coccidioidal infections consists of measures to build up the patient's general condition. Although specific medication of any value has not yet been reported, extirpation of isolated lesions in the epididymis or testis seems indicated.

SUMMARY

Two cases are presented which, so far is as known, are the first to be recorded of isolated metastasis of coccidioidomycosis infection to the genital tract. In one, infection still persists 20 months after epididymo-orchiectomy originally performed for what was considered to be tuberculous epididymitis. In the second case, the genital involvement was localized to the epididymis and testis and was apparently cured by simple epididymo-orchiectomy. The interval between the initial infection and the development of evidence of metastasis in the genital tract was extremely long in both instances.

These cases demonstrate the importance of considering coccidioidomycosis when confronted with a granulomatous lesion of the genital tract, especially in endemic areas, since the condition is so readily mistaken for tuberculosis.

REFERENCES

1. Forbus, W. D., and Bestebreurtje, A. M.: Coccidioidomycosis: A study of 95 cases of the disseminated type with special reference to the pathogenesis of the disease, Military Surgeon, 99:653-719, Nov. 1946.

2. Smith, C. E.: Coccidiosis, coccidioidomycosis (editorial), Radiology, 39:486-487, Oct. 1942.

3. Smith, C. E., Beard, R. R., Whiting, E. G., and Rosenberger, H. G.: Varieties of coccidioidal infection in relation to epidemiology and control of the disease, Am. J. Pub. Health, 36:1394-1402, Dec. 1946.

4. Smith, C. E.: Personal communication.

California
MEDICINE

OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8 PHONE DOUGLAS 2-0062

Editor, Dwight L. Wilbur, M.D. *Assistant to the Editor,* Robert F. Edwards
Editorial Executive Committee
Albert J. Scholl, M.D., Los Angeles H. J. Templeton, M.D., Oakland
Edgar Wayburn, M.D., San Francisco

For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIAL

Professional Incomes

Physicians in all states have recently received a questionnaire from the Office of Business Economics of the U. S. Department of Commerce, asking them to divulge the details of their professional incomes and expenditures. Questions have been raised in some quarters as to the advisability of answering this questionnaire and as to whether or not the statements made by the responding physician will be treated confidentially by government officials.

The answer to such questions could best be stated by saying, "Go ahead, doctor, and answer everything. It's all right."

The Office of Business Economics is an important cog in the commercial statistical division of our government. Its current project of surveying the income of physicians is part of a plan to make such surveys for lawyers, architects, dentists and other professional men, for the purpose of supplying accurate data for the use of professional as well as business and government interests. In this project, the government agency is working with the complete cooperation of the American Medical Association through its Bureau of Medical Economic Research.

Every effort is being made to secure a complete return of the questionnaires, so that a true picture of physicians' incomes may be secured. Both government and A.M.A. experts point to the fact that in previous surveys of this type the income figures have tended to exaggerate the net incomes of physicians because the men in smaller offices, often without adequate secretarial or bookkeeping service, ignored the questionnaires or failed to give information in sufficient detail to enable their returns to be tabulated in computing the average.

To avoid this exaggeration, the government and A.M.A. departments have devised a system of follow-up requests which should produce the needed information and not work a hardship on the physicians making their returns. The system includes a three-way mailing.

The first mailing is going to every other physician on the master file of the American Medical Association, about 100,000 in all. This is a short-form questionnaire which can be handled in a matter of seconds by the physician who has retired, gone out of medical practice or for any reason dropped from the ranks of active practitioners. For those in active practice, the form will require a little longer to complete but will not constitute a real hardship.

A second short-form questionnaire will also go to 10,000 physicians, each of whom will be identified by a code number on the outside of the return envelope. The third mailing will go to 15,000 doctors, also identified by a code number on the return envelope. The code numbers have been placed there for the sole purpose of enabling the surveyors to make follow-up mailings to these smaller lists in an effort to secure a 100 per cent return. Physicians who may be concerned over the presence of a code number may rest assured that once the numbered returns are received, they will be checked off the mailing list and once the return envelopes are opened, the identity of the sender is lost.

Every physician is urged to give this survey his whole-hearted cooperation so that an accurate study may be made. The medical profession is the first of the professional groups of the country to undergo this type of review and it is hoped that it may set a pattern which will encourage other professions to come forward with information which is of vital interest to medicine and government alike.

CALIFORNIA MEDICAL ASSOCIATION

DONALD CASS, M.D. ....President
H. GORDON MacLEAN, M.D. ....President-Elect
LEWIS A. ALESEN, M.D. ....Speaker
DONALD A. CHARNOCK, M.D. ....Vice-Speaker
SIDNEY J. SHIPMAN, M.D. ....Council Chairman
L. HENRY GARLAND, M.D. ....Secretary-Treasurer
DONALD D. LUM, M.D. ....Chairman, Executive Committee
DWIGHT L. WILBUR, M.D. ....Editor
JOHN HUNTON, Executive Secretary.......General Office, 450 Sutter Street, San Francisco 8
ED CLANCY, Field Secretary......Southern California Office, 417 South Hill Street, Los Angeles 13. Phone: MAdison 8863

NOTICES AND REPORTS

H. Gordon MacLean, President-Elect

The 1950 House of Delegates of the California Medical Association was unanimous in its selection of H. Gordon MacLean of Oakland as President-Elect for 1950-1951. His election to this high post climaxes a career of distinguished service both in professional and in medical organizational fields and comes as testimony of the esteem in which his peers hold him.

Born in Winnipeg, Canada, in 1896, Dr. MacLean received his preliminary education principally in Victoria, British Columbia. His medical degree was received from the Oakland College of Medicine and Surgery in the class of 1917 and he has remained in Oakland in practice since that time.

Dr. MacLean's start in medical practice came in the form of a preceptorship in internal medicine under the late Dr. William H. Streitmann, eminent Oakland internist. His activities were divided between private practice and service in the medical section of the Alameda County Hospital. After four years of preceptorship he became an associate of Dr. Streitmann's and continued in that capacity until the death of the senior physician. Since 1933 Dr. MacLean has been associated with Dr. T. C. McCleave, Jr.

During the course of his practice Dr. MacLean has occupied high offices in some of the leading hospitals in the East Bay area. From 1928 to 1946 he was a member of the medical staff and chief of medical service at Highland Alameda County Hospital and from 1947 to date he has served as consultant in medicine to that institution. He is a member of the attending staff at Merritt Hospital and past chief of the medical department there. He is a member of the active staff of Providence Hospital and for the past ten years has been chief of its medical department.

In community affairs, Dr. MacLean has been unusually active in noteworthy projects. For the past three years he has served as a member of the Institutions Commission of Alameda County, a body of public-spirited citizens which exercises considerable influence in the operation and maintenance of all public institutions in California's third largest county.

In a second field of community affairs, Dr. MacLean has been a director of Hospital Service of California, the northern California Blue Cross plan, since 1937, and has been president of that organization since 1942. In this capacity he has been one of the important leaders in the program of fostering prepaid budget-basis hospital and medical care cost insurance. This experience has been invaluable in the campaigns waged in the past five years by the

C.M.A. and the A.M.A. in fostering voluntary sickness cost insurance programs.

Dr. MacLean has served his county and state medical associations over a long period of years. In 1938 he was elected president of the Alameda County Medical Association and has been active in the policy-making level of that association to this date. In the California Medical Association he has been a member of the Council for four years, chairman of the Committee on Medical Economics for three years, chairman of the Executive Committee, chairman of the Auditing Committee and vice-chairman of the Council. For the past six years he has been a California delegate to the A.M.A. and has served on several committees in the A.M.A. House of Delegates.

Certified in internal medicine in 1937, Dr. MacLean was elected president of the California Society of Internal Medicine in 1949. He is married and the father of two sons.

H. Gordon MacLean has come by his new honor on the basis of his record and his past performance. He has been a willing and active worker at all times and has pledged his continued activities to the work ahead for the next two years. Those who know him know that this pledge will be scrupulously kept. In the field of public relations, in which he has been unusually active and interested, he is expected to provide the kind of leadership that will permit the California Medical Association to maintain its place of high rank among state medical associations.

C. M. A. ANNUAL SESSION 1950

Election of Officers, Councilors and A. M. A. Delegates

OFFICERS

President, Donald Cass, Los Angeles.

President-Elect, H. Gordon MacLean, Oakland.

Speaker, Lewis A. Alesen, Los Angeles, reelected.

Vice-Speaker, Donald A. Charnock, Los Angeles, reelected.

COUNCILORS AT LARGE

(Three-Year Terms)

Sidney J. Shipman, San Francisco, reelected.

Wilbur Bailey, Los Angeles, reelected.

Francis E. West, San Diego, reelected (formerly served as Council appointee to finish term of Walter S. Cherry, Rialto).

Ivan C. Heron, San Francisco, elected to serve remainder of term of H. Gordon MacLean, term expiring in 1951.

DISTRICT COUNCILORS

(Three-Year Terms)

First District, John D. Ball, Santa Ana, reelected.

Fourth District, Neil Dau, Fresno, elected to succeed Axcel E. Anderson, Fresno.

Seventh District, Donald D. Lum, Alameda, reelected.

DELEGATES TO AMERICAN MEDICAL ASSOCIATION

For terms January 1, 1951, to December 31, 1952.

DELEGATES

1. H. Gordon MacLean, Oakland.
2. E. Vincent Askey, Los Angeles.
3. Dwight L. Wilbur, San Francisco.
4. Donald Cass, Los Angeles.
5. Ralph B. Eusden, Long Beach.
6. R. Stanley Kneeshaw, San Jose.

ALTERNATES

1. Leopold S. Fraser, Richmond.
2. H. Clifford Loos, Los Angeles.
3. C. Kelly Canelo, San Jose.
4. L. Duke Mahannah, Long Beach.
5. J. Lafe Ludwig, Los Angeles.
6. Russel V. Lee, Palo Alto.

Names of members of standing committees of the California Medical Association, as appointed by the House of Delegates upon recommendation of the Council, are listed on Advertising page 6 of this issue.

C.M.A. dues for 1951: $40

1951 Annual Session: Los Angeles, May 13-16

In Memoriam

Barrow, William Hulbert. Died in San Diego, April 12, 1950, aged 63. Graduate of Harvard Medical School, Boston, 1916. Licensed in California in 1922. Dr. Barrow was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

DaCosta, A. Antonio. Died in Spring Valley, April 16, 1950, aged 45. Graduate of Howard University College of Medicine, Washington, D. C., 1931. Licensed in California in 1933. Dr. DaCosta was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

McCarty, Ray Bardwell. Died in Riverside, April 15, 1950, aged 50, of acute coronary occlusion. Graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1899. Licensed in California in 1931. Dr. McCarty was a member of the Riverside County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

McNeile, Olga. Died in Los Angeles, April 2, 1950, aged 67. Graduate of the University of California Medical School, Berkeley-San Francisco, 1910. Licensed in California in 1910. Dr. McNeile was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Montgomery, Robert Clyde. Died in Atwater, January 16, 1950, aged 68, of coronary thrombosis. Graduate of the Bennett College of Eclectic Medicine and Surgery, Chicago, 1911. Licensed in California in 1937. Dr. Montgomery was a member of the Merced County Medical Society, the California Medical Association, and the American Medical Association.

◆

O'Neill, Bernard Joseph. Died in San Diego, April 11, 1950, aged 73. Graduate of Rush Medical College, 1908. Licensed in California in 1909. Dr. O'Neill was a member of the San Diego County Medical Society, the California Medical Association, and the American Medical Association.

◆

Pomeroy, Frank Kenneth. Died in Fresno, April 1, 1950, aged 64, of a heart attack. Graduate of Columbia University College of Physicians and Surgeons, New York, 1914. Licensed in California in 1917. Dr. Pomeroy was a member of the Fresno County Medical Society, the California Medical Association, and the American Medical Association.

◆

Reynolds, Earl Owen. Died in Los Angeles, March 14, 1950, aged 60, of uremia. Graduate of the University of Louisville School of Medicine, 1914. Licensed in California in 1944. Dr. Reynolds was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

◆

Sheld-Ritchie, Iner. Died in Riverside, October 24, 1949, aged 65. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1915. Licensed in California in 1915. Dr. Sheld-Ritchie was a member of the Riverside County Medical Society, the California Medical Association, and the American Medical Association.

◆

Verhalen, John. Died in the Marshall Islands, April 11, 1950, aged 49. Graduate of Loyola University School of Medicine, Chicago, 1930. Licensed in California in 1944. Dr. Verhalen was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

◆

Walker, George Alvin. Died in San Francisco, April 18, 1950, aged 47, of coronary thrombosis, myocardial infarction. Graduate of the University of Kansas School of Medicine, Lawrence-Kansas City, 1935. Licensed in California in 1948. Dr. Walker was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

◆

Wharton, Joseph Earl. Died in Los Angeles, April 4, 1950, aged 35. Graduate of Ohio State University College of Medicine, Columbus, 1940. Licensed in California in 1947. Dr. Wharton was a member of the Orange County Medical Society, the California Medical Association, and the American Medical Association.

◆

Waters, Zura Orthello. Died in San Francisco, March 10, 1950, aged 60. Graduate of the College of Physicians and Surgeons, Los Angeles, 1918. Licensed in California in 1918. Dr. Waters was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

• Questions and Answers about C. P. S. •

Question: How may I best be assured of prompt payment for treatment of a veteran patient under the C.P.S.-V.A. Home Town Care Program?

Answer: The best—and only—way to assure your prompt payment for treatment of a veteran is as follows: Within five days of the initial visit submit a Request for Authorization (Form 52) to C.P.S.-V.A. headquarters in San Francisco, Los Angeles or San Diego, depending on your location. When the request has been processed, and if the veteran is eligible for treatment under the Home Town Care Program, you will be sent an Authorization for Treatment (Form 53). At the end of the authorized period (normally a calendar month) return Form 53 to C.P.S.-V.A., showing the authorized services which have been rendered during the period covered by the authorization. Your bill will then be processed by C.P.S.-V.A. and payment will follow.

Many questions of this type can be answered by reference to the C.P.S.-V.A. pamphlet entitled "General Instructions."

Question: How will the services toward the $5,000 allowable under catastrophic coverage be computed?

Answer: Payments toward the $5,000 will be based on the current fee schedule paid by California Physicians' Service to member doctors. If the patient's annual gross family income exceeds $3,600 or if services are performed by a non-member physician, the C.P.S. payments will be applied to the physician's usual charge for the services. In such cases, any amount charged directly to the patient by the doctor is not included in the $5,000 liability of C.P.S.

Question: Under the medical care while hospitalized contract, what medical services are included?

Answer: Non-surgical professional services, when a registered bed patient in a licensed hospital. That is, services for treatment of such conditions as pneumonia, heart trouble, strokes, etc.

Question: Is there a limit to the number of times each day the doctor may visit the patient, under the two-visit deductible or the medical care while hospitalized contract?

Answer: No. There is no limit to the number of necessary visits. The patient, however, pays for the first two in each illness or injury.

Question: Which C.P.S. members are entitled to laboratory and x-ray services when not hospitalized?

Answer: With the exception noted below, only those members having two-visit deductible medical benefits or catastrophic coverage are entitled to laboratory and x-ray services when not hospitalized.

The exception is that all C.P.S. members, including those having only surgical-hospital benefits, are entitled to x-rays to determine a possible fracture or dislocation—in case of recent injury or illness—whether they are in or out of the hospital. C.P.S. pays for these x-rays even if they reveal that no fracture or dislocation exists. When billing C.P.S. for such x-rays, doctors should indicate that they were made to determine fracture or dislocation.

Question: Is it possible for persons to join C.P.S. if they are not members of an employed group of five or more people?

Answer: Yes. Last year the new individual family plan was made available throughout Northern California to persons not eligible for group enrollment. It has now been extended to Southern California.

Individual family plan memberships provide surgical and hospital benefits for the subscriber and family members alike.

Qualifications for individual C.P.S. membership are easily met. Details are available from any C.P.S. office.

Question: Are individual family plan members and direct pay members the same?

Answer: No. "Individual" members are those who join C.P.S. through the individual family plan. "Direct pay" members are those who joined C.P.S. through a group enrollment at their place of employment, but who later left their jobs and continued their C.P.S. membership by making direct dues payments to C.P.S.—instead of paying dues through the group where they joined.

Question: Does it cost more to continue C.P.S. membership on the direct pay basis than it does as part of a group?

Answer: Yes, there is a small increase in dues for direct pay members. This increase is necessary because the clerical costs of handling direct payments are greater for C.P.S. than the costs of handling dues paid by an entire group. A further reason, supported by actuarial studies, is that persons who leave the group where they joined C.P.S. often do so for a reason which will be reflected in greater use of their C.P.S. membership. For example, persons who retire from work for reasons of age or health utilize C.P.S. protection more than others.

Question: What is the catastrophic plan?

Answer: The catastrophic plan provides protection up to a total of two years or $5,000 against medical and surgical costs of cancer, poliomyelitis, tuberculosis, and 20 other of life's most severe, costly diseases and ailments.

NEWS and NOTES

NATIONAL • STATE • COUNTY

FRESNO

Recommendation that a **pathologist** be engaged by Fresno County for assignment on a part-time basis to the **coroner's office** was forwarded to the board of supervisors last month by the Fresno County Medical Society. It was suggested that the medical examiner be made responsible for determining the cause of death as set down on death reports and that he be available for advice to the coroner in any case in which doubt as to diagnosis might indicate the necessity for autopsy.

LOS ANGELES

The 49th annual meeting of the **American Proctologic Society** will be held in Los Angeles, July 2 to 5, 1950. Information regarding the meeting and the program may be obtained from Wendell Green, M.D., 201 Professional Building, 1838 Parkwood Avenue, Toledo 2, Ohio.

* * *

A **research fund of $3,500** for investigation of diseases of the heart and lungs was presented to the University of California Medical Center, Los Angeles, by the Bay District Surgical Society. The society is made up of a group of Los Angeles, Beverly Hills and Santa Monica surgeons. Members of the staff of the U.C.L.A. Medical School and of the Wadsworth Veterans Administration Hospital will cooperate in the study, which will be concerned primarily with heart disease stemming from rheumatic fever.

* * *

The Los Angeles Obstetrical and Gynecological Society named **Dr. Erle Henriksen,** associate professor of gynecology at the University of Southern California, as **winner of its second annual essay award** for the most outstanding paper on obstetrics and gynecology published during 1949. The winning paper, "The Lymphatic Spread of Carcinoma of the Cervix and of the Body of the Uterus," was published in the *American Journal of Obstetrics and Gynecology,* November 1949.

* * *

A three-day **course in medicolegal problems,** jointly sponsored by the University of California Extension and the School of Medicine and the School of Law, University of California at Los Angeles, is to be given on the U.C.L.A. campus June 19, 20, and 21. Louis J. Regan, M.D., LL.B., professor of legal medicine, College of Medical Evangelists, will be general chairman of the course.

Requests for programs for the course and applications for enrollment may be addressed to S. J. Weinberg, M.D., Head of Postgraduate Instruction, Medical Extension, University of California, Los Angeles 24.

* * *

University of California Extension and the University's School of Medicine have announced a **postgraduate course in diagnosis and therapy of cancer,** including clinical surgery, radiation therapy and endocrine therapy, to be held from July 17 to 22 in the medical library conference room, fourth floor, General Medical and Surgical Hospital, Veterans Administration Center, Los Angeles.

Complete announcement of the course, together with an enrollment blank, may be obtained from the Office of Medical Extension, University Extension, University of California, Los Angeles 24, California. Fee for the course is $100.

SACRAMENTO

The second annual scientific assembly of the **California Academy of General Practice** will be held in Sacramento November 8, 9 and 10, 1950. Attendance of 600 to 700 is expected. Chairman of the committee on local arrangements is Dr. John Rovane of Sacramento, and general chairman of the meeting is Dr. Merlin Newkirk of Los Angeles.

The academy recently announced that Mr. William Rogers, now an employee of Alameda County Medical Association, has been engaged as executive secretary. He will take over his duties with the academy July 1.

SAN DIEGO

Dr. Alvin R. Leonard, formerly of the Bureau of Adult Health, recently accepted appointment as assistant director of the San Diego City-County Health Department, a position which had remained open since July 1949, when Dr. J. B. Askew, then assistant, was appointed health officer upon the retirement of Dr. Alex Lesem.

SAN FRANCISCO

Stanford University School of Medicine has announced 13 **postgraduate courses for practicing physicians** to be held September 11 to 15, 1950. Morning courses, Monday through Friday, 8:30 to noon: (1) general surgery; (2) acute surgical emergencies; (3) surgical anatomy; (4) internal medicine; (5) electrocardiography; (6) diseases of the chest; and (7) pediatrics.

Afternoon courses, Monday through Friday, 1:30 to 5: (8) surgical anatomy; (9) proctology; (10) fundamentals of roentgen diagnosis; (11) fractures; (12) internal medicine; and (13) obstetrics and gynecology.

Fee for two courses (one morning course and one in the afternoon) is $75. Applications and requests for information should be directed to: Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15.

* * *

A **postgraduate course in psychiatry and neurology,** to be held at the Langley Porter Clinic, August 28 through November 17, 1950, has been announced by the Extension Division of the University of California School of Medicine. A repetition of a course given previously, it is particularly designed to prepare psychiatrists and neurologists **for taking the examinations of the American Board of Psychiatry and Neurology.** Fee for this course is $200. Further information may be obtained from Stacy R. Mettier, M.D., Head of Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22, California.

AMERICAN MEDICAL ASSOCIATION

Annual Session

SAN FRANCISCO, JUNE 26-30, 1950

Contemporary Scientific and Social Meetings

A number of scientific organizations and social groups have scheduled meetings in San Francisco during or immediately before or after the A.M.A. Annual Session. A list of announcements of such meetings that have been received by CALIFORNIA MEDICINE follows:

UNIVERSITY OF PENNSYLVANIA ALUMNI SOCIETY DINNER

Fairmont Hotel

June 28, 7 p.m.

Principal Speakers: Dean John McKenney Mitchell, and I. S. Ravdin, John Rea Barton professor of surgery.

Address: Dwight L. Wilbur, M.D., 655 Sutter St., San Francisco.

SOCIETY FOR VASCULAR SURGERY (Scientific Program)

Fairmont Hotel

June 25, morning (9 o'clock) and afternoon (2 o'clock) session. (Meetings open to all physicians).

GEORGE WASHINGTON UNIVERSITY MEDICAL ALUMNI DINNER

Fairmont Hotel

June 29, 7 p.m.

Address: Angelo May, M.D., 450 Sutter St., San Francisco.

A.M.A. GOLF TOURNAMENT

Olympic Golf Club (two courses)

June 26

Address: William J. Burns, Secretary American Medical Golfing Association, 2020 Olds Tower, Lansing 8, Michigan.

PHI BETA PI DINNER

Union League Club, 555 Post St.

June 27, 7 p.m. (Cocktails at 6 p.m.)

Tickets available at a registration desk at A.M.A. convention headquarters.

TUFTS MEDICAL ALUMNI ASSOCIATION DINNER

Rickey's Town House, Van Ness Ave. and Clay St.

June 28, 6:30 p.m.

Tickets: A.M.A. Registration Area 1, or John F. Martin, M.D., 1155 Jones St., San Francisco 9.

1ST MEDICAL REGIMENT REUNION

Claremont Hotel, Berkeley

June 28, 6:30 p.m.; cocktails; 8:00 p.m., dinner ($3.50).

Address: Charles B. Hudson, M.D., 400 29th St., Oakland 9; or Louis B. Goldstein, M.D., 450 Sutter St., San Francisco 8.

AMERICAN COLLEGE OF CHEST PHYSICIANS

St. Francis Hotel

June 22-25

Oral and written examinations for Fellowship will be held June 22. Candidates who would like to take the examination should make arrangements with Murray Kornfield, 500 North Dearborn St., Chicago 10, Illinois.

THE SOCIETY FOR INVESTIGATIVE DERMATOLOGY

Clift Hotel

June 25-26

(See Archives of Dermatology and Syphilology, May 1950, for scientific program).

WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

Curran Theater

June 24, 9 a.m. to 5 p.m.

All A.M.A. members invited to attend.

INTERNATIONAL ACADEMY OF PROCTOLOGY

Second Annual Convention (Scientific Program)

June 23-24

Address: Alfred J. Cantor, M.D., 43-55 Kissena Blvd., Flushing, N. Y.

SHASTA

Appointment of **Dr. Byrl Rittenhouse** of Riverside as Tehama County physician, effective July 15, was announced last month by the board of supervisors. Dr. Rittenhouse, who will succeed Dr. Thomas D. Wyatt, now serving on a part-time basis, received the appointment after a letter from the Shasta County Medical Society, pledging support and assistance to him, was read to the county supervisors. In accepting the position, the new county physician said it was with the understanding that the supervisors would favor permitting members of the medical society to make the rounds of the hospital.

SOLANO

Dr. H. Gordon MacLean of Oakland, President-elect of the California Medical Association, principal speaker at a meeting of the Solano County Medical Society last month, discussed **"Legislation and Public Relations."**

Other C.M.A. officials at the meeting, which was also attended by guests from the Marin, Napa and Sonoma county medical societies, were Dr. Alson Kilgore of San Francisco; Dr. Dwight H. Murray of Napa, a Trustee of the American Medical Association; Dr. John W. Green of Vallejo, C.M.A. Councilor for the Ninth District; and Dr. F. R. Hook of San Francisco, medical director of the C.M.A. Cancer Commission.

SONOMA

Dr. Robert Westphal, who recently resigned as director of the Riverside County Health Department, was appointed to a similar position in Sonoma County, effective May 1. Dr. Westphal had served in Riverside since June 1948. Before that he was deputy county health officer at Rochester, N. Y.

GENERAL

At the annual meeting of the **California Society of Allergy,** held in San Diego May 1, 1950, the following officers were elected for 1950: President, Frank G. Crandall, Jr., M.D., Los Angeles; president-elect, Samuel H. Hurwitz, M.D., San Francisco; secretary-treasurer, M. Coleman Harris, M.D., Beverly Hills.

* * *

The Foundation of the **American Society of Plastic and Reconstructive Surgery** offers as its **1950 award $500** (first prize of $300, second prize of $200) and a certificate of merit, for essays on some original unpublished subject in plastic surgery.

Competition is limited to residents in plastic surgery of recognized hospitals and to plastic surgeons who have been in such specific practice for not more than five years.

The first prize essay will appear on the program of the forthcoming annual meeting of the American Society of Plastic and Reconstructive Surgery, to be held in Mexico City, November 27 to 29, 1950. Essays must be in before August 15, 1950.

Further details may be obtained from Dr. Clarence R. Straatsma, 66 East 79th Street, New York, N. Y.

* * *

Five California institutions last month received **U. S. Public Health Service grants** totalling $36,518 to aid in laboratory and clinical research on cancer. Two of the grants went to the University of California—$5,298 for studies on the serial passage of Hodgkin's disease extracts in chicken eggs, under the direction of Dr. Warren L. Bostick; $12,000 for isotopic tracer studies of tissue synthesis and the reactions of metabolic antagonists, under the direction of Dr. David Greenberg.

The Laboratory for Research on the Treatment of Cancer, Boulder Creek, was awarded $1,225. Los Angeles County Hospital received $12,500 in support of studies conducted by Dr. Harold F. Pearson on metabolism of tissue in relation to propagation of viruses, and Mount Zion Hospital, San Francisco, was allotted $5,500 for studies by Dr. Gerson R. Biskind on hormone metabolism of experimental ovarian tumors in rats.

BOOK REVIEWS

MORE ABOUT PSYCHIATRY. By Carl Binger, M.D. The University of Chicago Press, Chicago, 1949. $4.00.

The author of this book is associate professor of clinical psychiatry at Cornell University Medical College. A previous volume of his, "The Doctor's Job," won the Norton Medical Award in 1945.

The book is made up of a series of lectures and articles which have been published previously. It is, therefore, a collection of independent essays. The chapters, however, fit in together fairly well, the first four covering problems of psychosomatic medicine followed by a discussion of psychiatric problems and mental health.

The book is designed primarily for popular reading, although the general medical profession will find considerable useful information in it. It is the type of book which a doctor can recommend to a patient who wishes some information along these lines. The chapter on psychoanalysis is a rather good presentation of this subject for those with no knowledge of the subject.

This book, therefore, can be recommended as a good book for popular reading for those who wish further information about psychosomatic medicine and psychiatry.

* * *

QUESTIONS, MEDICAL STATE BOARD, AND ANSWERS. By R. Max Goepp, M.D., Formerly Professor of Clinical Medicine, and Harrison F. Flippin, M.D., Associate Professor of Medicine, both of Graduate School of the University of Pennsylvania. Eighth Edition. W. B. Saunders Company, Philadelphia, 1950. $7.50.

The eighth edition of this old reliable comes after an elapsed period of 11 years since the last edition. It shows evidence of revamping and having been brought up to date in all chapters. A new chapter on psychiatry has been added.

The collaboration of Dr. Harrison F. Flippin, associate professor of medicine, Graduate School of the University of Pennsylvania, has been obtained, along with a staff of qualified editorial consultants.

The subject matter covered is necessarily broad but is done well and adequately. The use of such a volume is admittedly limited but the book accomplishes its purpose very well indeed.

* * *

THE YELLOW EMPEROR'S CLASSIC OF INTERNAL MEDICINE—Chapters 1-34. Translated from the Chinese with an Introductory Study by Ilza Veith, M.A., Ph.D., Lecturer in the History of Medicine, The University of Chicago. The William and Wilkins Company, Baltimore, 1949. $5.00.

How the venerable ancients reached a ripe old age was described by Ch'i Po, physician to the Yellow Emperor, Huang Ti, more than 4,000 years ago: "In ancient times ... people . . . understood Tao (and) patterned themselves upon the Yin and the Yang and they lived in harmony with the arts of divination.

"There was temperance in eating and drinking. Their hours of rising and retiring were regular and not disorderly and wild. By these means the ancients kept their bodies united with their souls, so as to fulfill their allotted span completely, measuring unto a hundred years before they passed away."

This, briefly, summarizes much of the medical philosophy expounded throughout the Nei Ching, the Yellow Emperor's Classic of Internal Medicine. And this is the basis of Chinese medicine as it has been practiced through the ages to the present time.

It becomes obvious, immediately, that Chinese medicine is not *scientific* as the Occidental understands the term. It recognizes no accurate anatomy. The chief method of diagnosis is the examination of the pulse. The two methods of healing are the often extremely painful acupuncture and moxibustion. On the other hand, Chinese medicine seeks to prevent illness by setting up a rational system of living. This system depends upon the understanding of Tao, the Right Way. It depends upon acting in accordance with Yin and Yang, the two great principles in nature. And it depends upon the comprehension and practice of numerology. The Nei Ching is the basic textbook of this system. Started perhaps 5,000 years ago, it is a body of folk literature that has grown with time.

In producing this English edition of the Nei Ching, Ilza Veith has performed a difficult feat with distinction. The actual translation takes up only two-thirds of the book. The remainder includes a comprehensive introduction and background explanation of the text. These, along with considerable appendices, help give the reader a basis of understanding for the text proper.

While the reader will not increase his technical knowledge with the Nei Ching, he will find in it rich food for philosophical thought along with some fascinating reading. The publishers have done a fine job of printing on parchment-like paper and have bound the book appropriately in yellow and black.

* * *

STEDMAN'S MEDICAL DICTIONARY — Seventeenth Revised Edition. Edited by Norman Burke Taylor, M.D., The Williams and Wilkins Company, Baltimore, Maryland, 1949. $8.50.

The 17th edition of this scholarly work carries on in the tradition of its predecessors. It is, with certain reservations, an excellent reference on the definitions of medical terms. In order to get the most out of the body of the dictionary, the reader needs to be familiar with some of the appendices, particularly those on medical etymology and the keys to pronunciation and abbreviations.

The reviewer disagrees with the "ivory tower" attitude of the editors in regard to the omission and deletion of trade names. A medical dictionary, by its very nature, must be a complete book of information. The student must be able to find in it anything he needs pertaining to medical words. Whether one approves or disapproves of pharmaceutical and other trade names, they are with us and their existence may as well be acknowledged. Indeed, if the dictionary is not the right book to identify them, what is? (It is noted that the editors have made certain exceptions for trade names which have been accepted in general literature, e.g., adrenalin. Why not include all such words in a separate section?)

* * *

DISEASES OF THE AORTA—Diagnosis and Treatment. By Nathaniel E. Reich, M.D., Associate in Medicine, Long Island College of Medicine. The Macmillan Company, New York, 1949. $7.50.

This is a remarkably complete book for its size and discusses diseases of the aorta from the embryologic, clinical, and radiologic aspects. Each abnormality is clearly illustrated with line drawings and with angiocardiograms. The diagnosis of each lesion is tabulated in simple fashion for ease of reference.

The author has several unusual chapters on diagnostic procedures not requiring radiologic equipment, as well as a chapter discussing angiocardiography, kymography, abdominal arteriography, electrokymography and cardiac catheterization. There is a short chapter on antibiotics and one on anticoagulants; neither seems to be pertinent to the text, but both are useful adjuncts.

Each chapter has a complete bibliography which adds considerably to the value of the book.

The variety of subjects discussed necessitates a rather brief discussion of each one, but the author has succeeded rather well in emphasizing the important phases of each subject.

The radiologic illustrations are very good; the only suggestion for future editions would be to increase the size of the figures for clarity.

This comprehensive monograph should be well received by the physician interested in diseases of the aorta.

* * *

TUBERCULOSIS—A Global Study in Social Pathology. John B. McDougall, C.B.E., M.D., F.R.C.P. (Edin.), Section of Tuberculosis, World Health Organization. The Williams and Wilkins Company, Baltimore, 1949. $6.00.

The subtitle of this volume indicates the scope of the problem considered. The author's position with W.H.O. (United Nations) places him in a unique position to speak with authority. The first one-third of the book consists of statistical information and comments on the tuberculosis problem of each nation on the earth arranged in alphabetical order. Such information is not available elsewhere to the knowledge of the reviewer and makes this an important source book of information.

The next part contains a summary of prevailing views as to the various factors relating to morbidity and mortality from tuberculosis dealing particularly with sociologic, economic and racial factors.

The third part of the book includes detailed recommendations for the investigation of the tuberculosis problem in a community. Well planned and very specific recommendations are made for the organization of tuberculosis services under varying conditions.

The data presented make it quite clear that the methods utilized in the United States for the prevention and treatment of tuberculosis are not widely applicable to many population groups in other countries. Vaccination with BCG is regarded by the author as the most fruitful approach to the problems of tuberculosis which exist in many nations.

* * *

NORMAL VALUES IN CLINICAL MEDICINE. By F. William Sunderman, M.D., Ph.D., Professor of Experimental Medicine and Clinical Pathology, University of Texas Postgraduate School of Medicine; and Frederick Boerner, V.M.D., Late Associate Professor of Clinical Bacteriology, Graduate School of Medicine, University of Pennsylvania. W. B. Saunders Company, Philadelphia, 1949. $14.00.

In this volume, the authors have done a remarkable job of compilation and sorting, and they have done it with considerable discrimination. They have presented as much data as they could assemble on normal values for all the different systems and regions of the body. They have also collected data on such miscellaneous odds and ends as statistical methods, food values, drugs and doses, isotopes, life and actuarial tables, and tables of weights, measures and standards. In fact, in this book one can find normal values for anything from the reticulocyte count of a healthy man at different altitudes to the number of chews in a standard meal.

With such a tremendous number and variety of values and with the necessary bibliography involved, criteria are sometimes difficult to establish. The reader may not agree with a fair amount of the work quoted, but he must understand that the authors had to start and to stop somewhere in choosing material. And one is bound to note discrepancies: In discussing the normal heart rate (page 5), after mentioning that it is subject to wide physiological variation, the statement is made, "at rest the heart averages 70 to 72 beats per minute." Then, a few lines later, the rate is given as 70 to 75 beats per minute. Differences also occur from page to page in the values given for the chemical components of the blood. Furthermore, many tests are simply mentioned by title and not elaborated upon, which is unfortunate. It does the reader little good, for instance, to read only that the "Schneider Index is an exercise tolerance test that has a rather complex method of scoring and is based upon the differences in heart rate and blood pressure measurement after change of body position and after exercise."

The book is most valuable in giving specific values, especially in tables, for different parts of the body for both adults and children of different ages. In one important aspect of normal values, it does not help the reader: It does not answer the question of how much deviation from the normal is likely to mean abnormality enough to connote disease. However, another book as large as this volume would be necessary to provide that answer.

Whether or not one approves of the criteria, of the individual quotations, or of the discrimination in evaluating the work quoted, one must concede that in this book the authors have produced a reference of unique value. It is to be recommended for every medical library.

* * *

PHYSIOLOGY OF HEAT REGULATION AND THE SCIENCE OF CLOTHING. Prepared at the Request of the Division of Medical Sciences, National Research Council. Edited by L. H. Newburgh, M.D., Professor of Clinical Investigation, The Medical School, University of Michigan. W. B. Saunders Company, Philadelphia, 1949. $7.50.

The editor has collected a remarkable group of essays on a very important subject and one which commands the respect of every physiologist and should capture the interest of every physician. In this volume appears the simple expression of the mechanism of maintaining constant temperature in the human economy, with the most detailed elaboration of the complicated mechanisms which are responsible for maintaining this equilibrium at the extremes of temperature and humidity. The physiologic exchanges of heat loss and production are given both from the biologic and thermodynamic viewpoints. The mechanisms of conduction, radiation, convection and evaporation in maintaining temperature equilibrium are described and expressed in masterful fashion. The first chapter on adaptation to climatic environment is written by F. R. Wulsin, and constitutes a small monograph on an important socio-anthropological study of various peoples of the world exposed to the extremes of temperature; it provides an excellent discussion of human compensations and adaptations to the environment. Aside from the information contained in the monograph, it is delightful reading.

On the whole, the book attempts to describe the marvels of the heat regulation mechanism under the entire range of climatic conditions encountered by the human subject on the earth's surface. Emphasis is placed on the capacity of the mechanisms which are devised to preserve life under the most adverse conditions.

The last third of the volume deals with the topic of the thermobarrier of clothing, which introduces a most detailed and objective study of fabrics and the application of field studies to determine their efficiency, as well as the homeothermic mechanisms of the human body in the desert, the tropics, dry cold climates, wet cold climates, and under circumstances of immersion. It is a highly technical volume, and one which will stand as authoritative for many years to come. It is highly recommended as the final word on the physiology of heat regulation.

CALIFORNIA MEDICINE

Index to Volume 72, January-June 1950

KEY TO ABBREVIATIONS USED IN INDEX

(Or.)—Original Article.
(Ed.)—Editorial.
(MP)—Medical Progress.
(CPC)—Clinical-Pathological Conference.
(CS)—Clinical Symposium
(CMA)—California Medical Association.
(CR)—Case Report.
(I)—Information.
(LE)—Letter to the Editor.
(MJ)—Medical Jurisprudence.

AUTHOR INDEX

PAGE

A

Allington, H. V., *Oakland* 156
Armanino, L. P., *Stockton* 178

B

Bassett, J. Brandon, *San Francisco* 465
Bauer, Julius, *Los Angeles* 204
Benson, Ralph C., *San Francisco* 442
Bercel, Nicholas A., *Los Angeles* 234
Bine, René, Jr., *San Francisco* 14
Biskind, Gerson, *San Francisco* 148
Black, J. Harvey, *Dallas, Texas* 369
Boland, Edward W., *Los Angeles* 405
Bookman, Ralph, *Los Angeles* 179
Bower, Albert G., *Pasadena* 425
Buck, Leonard S., *Los Angeles* 34
Burnip, Robert, *Bakersfield* 31
Buss, William C., *Bakersfield* 167
Byers, Sanford O., *San Francisco* 14

C

Caplan, Paul E., *Berkeley* 26
Chaffin, Lawrence, *Los Angeles* 239
Chudnoff, Jack S., *Los Angeles* 425
Clark, Albert G., *San Francisco* 447
Cohen, Robert, *Bakersfield* 31
Cohn, Roy, *San Francisco* 176
Cosby, Richard S., *Los Angeles* 431

D

Deuel, Harry J., Jr., *Los Angeles* 197

F

Farber, Eugene M., *San Francisco* 4
Flocks, R. H., *Iowa City, Iowa* 7
Fournier, Dudley J., *Los Angeles* 245
Frenkel, Jacob Karl, *San Francisco* 174
Friedman, Meyer, *San Francisco* 14

G

Garland, L. Henry, *San Francisco* 99
Gendel, Samuel, *Anaheim* 37
Gibson, Thomas E., *Bakersfield* 167
Gifford, John H., *Los Angeles* 18
Gifford, Myrnie A., *Bakersfield* 167
Griffith, George C., *Los Angeles* 431
Grubschmidt, H. A., *St. Helena* 243

H

Hilding, A. C., *Duluth, Minnesota* 103, 208
Hopper, James J., Jr., *San Francisco* 415

PAGE

J

Johnson, Donald A. *Tulare* 422
Jones, Chester M., *Boston* 1
Jones, John C., *Los Angeles* 352

K

Keeney, Edmund L., *San Diego* 377
Kneeshaw, R. Stanley, *San Jose* 337
Knouf, Evelynne, *South Pasadena* 79
Knutti, Ralph E., *Los Angeles* 60

L

Lamb, Woodburn K., *Berkeley* 113
Levine, Eugene B., *Los Angeles* 91
Levinson, David C., *Los Angeles* 431
Lewis, Leon, *Berkeley* 26
Lindner, Harold H., *San Francisco* 58
Lunsford, C. J., *Oakland* 350

M

MacLaren, W. R., *Pasadena* 453
Manwaring, W. H., *Palo Alto* 66, 123, 248
Marcus, Sanford, *San Francisco* 58
Marshall, Matthew, Jr., *San Francisco* 390
Martin, Helen Eastman, *Los Angeles* 133
Mason, Verne R., *Beverly Hills* 226
Mathewson, Carleton, Jr., *San Francisco* 176
McNamara, Thaddeus M., Jr. *San Francisco* 390
Mehl, John W., *Los Angeles* 133
Merrill, Malcolm H., *Berkeley* 22
Miller, Alden H., *Los Angeles* 34
Miller, H., *Los Angeles* 215
Miller, Richard D., *Pasadena* 373
Molony, Clement J., *Beverly Hills* 89

N

Naffziger, Howard C., *San Francisco* 174
Nathanson, M. R., *Los Angeles* 215
Neff, J. Louis, *Houston, Texas* 170
Norman, Frank W., *San Francisco* 465
Novy, Frederick G., Jr., *Oakland* 201

O

Owyang, Edwin, *San Francisco* 57

P

Partridge, John W., *San Francisco* 415
Paxton, John R., *Glendale* 142
Payne, J. Howard, *Los Angeles* 142
Peabody, Homer D., Jr., *San Diego* 450

Perry, Thomas L., *Los Angeles* 159
Popkin, Roy J., *Los Angeles* 108
Pudenz, Robert H., *Pasadena* 156

Q

Quinn, William F., *Los Angeles* 18

R

Rees, Clarence E., *San Diego* 363
Rosove, Leon *Santa Monica* 425
Rossi, Felix R., Jr., *Fairfield* 222
Rowe, Albert H., *Oakland* 228
Rowe, Albert, Jr., *Oakland* 228
Russell, William O., *Houston, Texas* 170

S

Schaller, Walter F., *San Francisco* 164
Schmidt, Otto E. L., *San Francisco* 4
Schulte, John W., *San Francisco* 390
Scott, W. S., *Stockton* 178
Sharpe, Walter E., Jr., *Los Angeles* 391
Shelden, C. Hunter, *Pasadena* 156
Shirley, Robert G., *Beverly Hills* 85
Simonsen, D. G., *Los Angeles* 133
Snyder, William H., Jr., *Los Angeles* 239
Speed, Kellogg, *Chicago* 93
Suckle, Edward, *Los Angeles* 119
Sundberg, R. H., *San Diego* 450
Szurek, S. A., *San Francisco* 357, 454

T

Targow, A. M., *Los Angeles* 461
Thompson, James H., *San Francisco* 118
Totten, Harold P., *Inglewood* 365

V

Van Valin, William, *Los Angeles* 239
Vracin, Daniel J., *Downey* 120

W

Wertman, Maxine, *Los Angeles* 133
Westover, Leola, *Los Angeles* 133
Weyrauch, Henry M., *San Francisco* 465
Wilbur, Dwight L., *San Francisco* 145
Winsor, Travis, *Los Angeles* 342

SUBJECT INDEX

A

Abortion, Habitual, by Ralph C. Benson, San Francisco (Or.) 442
(ACTH) Cortisone and Adrenocorticotropic Hormone, Effects of, on Certain Rheumatic Diseases, by Edward W. Boland, Los Angeles (Or.) 405
Acute Pancreatitis, by John R. Paxton, Glendale, and J. Howard Payne, Los Angeles (Or.) 142
Acute Volvulus of the Cecum—A Method of Diagnosis, with Report of a Case, by Harold H. Lindner and Sanford Marcus, San Francisco (Or.) 58
Agranulocytosis, Fatal, Acute, Following Prolonged Administration of Small Doses of Sulfadiazine for Urinary Bacteriostasis, by Matthew Marshall, Jr., Thaddeus McNamara, Jr., and John W. Schulte, San Francisco (CR) 390
Alcoholism—Studies by a Special Committee of the California Medical Association (Or.) 40
Allergic Parotitis, by Ralph Bookman, Los Angeles (CR) 179
Allergic Reaction to Decholin Used in Circulation Test, Report of a Case, by Edward Suckle, Los Angeles (CR) 119
A.M.A. Clinical Session (Ed.) 64
A.M.A. in San Francisco (Ed.) 392
Anaphylactic Shock Following Intravenous Thiamine Chloride: Report of a Case, by L. P. Armanino and W. P. Scott, Jr., Stockton (CR) 178
Annual Session Programs and Reports (CMA) 265
Antihistaminic Drugs, Histamine and the, by Edmund L. Keeney, San Diego (MP) 377
Anuria and Oliguria—A Review of Symptoms, Pathologic Physiology and Mortality Rates—Part I, by James J. Hopper, Jr., and John W. Partridge, San Francisco (Or.) 415
Asthma, The Diagnostic Problem in, by J. Harvey Black, Dallas, Texas (Or.) 369
Atelectasis, Postoperative, Some Phases of—The Role of Ciliary Action in the Absorption of Air, by A. C. Hilding, Duluth, Minn. (Or.) 208

B

Bilateral Calculus Disease of the Kidney, Some Aspects of, by R. H. Flocks, Iowa City, Iowa (Or.) 7
Bile Peritonitis Due to Spontaneous Rupture of a Dilated Intrahepatic Duct: Report of a Case, by Dudley J. Fournier, Los Angeles (CR) 245
Bowel, Large, Surgical Management of the Injured, by Samuel Gendel, Anaheim (Or.) 37
Bronchial Asthma in Adults—Causes and Treatment, by Albert H. Rowe and Albert Rowe, Jr., Oakland (Or.) 228

C

Cancer Detection Centers—The Experience to Date in California, by L. Henry Garland, San Francisco (Or.) 99
Cardiac Catheterization in Adult Congenital Heart Disease—A Preliminary Report, by George C. Griffith, Richard S. Cosby, and David C. Levinson, Los Angeles (Or.) 431
Case History of Uncle Sam, by R. Stanley Kneeshaw, San Jose (Or.) 337
Case of Acute Porphyria, A: Remissions Induced with Procaine Intravenously, by H. A. Grubschmidt, St. Helena (CR) 243
Catastrophe Coverage (Ed.) 181
Change in A.M.A. By-Laws—Membership Dues (CMA) 125
Chloramphenicol in the Treatment of Typhoid Fever, by Leon Rosove, Santa Monica, Jack S. Chudnoff, Los Angeles, and Albert G. Bower, Pasadena (Or.) 425
Cholangiography Following Common Duct Drainage, Clarence E. Rees, San Diego (Or.) 363
Chronic Diseases and Government (Ed.) 392
Chronic Relapsing Pancreatitis, by Dwight L. Wilbur, San Francisco (Or.) 145
Ciliary Action, The Role of, in Absorption of Air—Some Phases of Postoperative Atelectasis, by A. C. Hilding, Duluth, Minn. (Or.) 208
Clinical Potassium Problems, by Helen Eastman Martin, Maxine Wertman, Leola Westover, D. G. Simonsen, and John W. Mehl, Los Angeles (Or.) 133
Clinical Significance of Urinary 17-Ketosteroid Assays, by Gerson Biskind, San Francisco (Or.) 148
Coccidioidin Skin Testing During Pregnancy and in Infants and Children, by Robert Cohen and Robert Burnip, Bakersfield (Or.) 31
Coccidioidomycosis of the Genital Tract, by Henry M. Weyrauch, Frank W. Norman, J. Brandon Bassett, San Francisco (CR) 465
Coccidioidomycosis of the Meninges, by William C. Buss, Thomas E. Gibson, and Myrnie A. Gifford, Bakersfield (Or.) 167

Communicable Diseases—What's New in Pediatrics, by Evelynne Knouf, South Pasadena (Or.) 79
Congenital Absence of the Gallbladder, by Walter E. Sharpe, Jr., Los Angeles (CR) 391
C.P.S. to Change Contracts and Fees Only Once Yearly (CMA) 189

D

Decholin, Allergic Reaction to in Circulation Test, Report of a Case, by Edward Suckle, Los Angeles (CR) 119
Decubiti, Skeletal Suspension in the Treatment of, by Albert G. Clark, San Francisco (Or.) 447
Dermatology, The Newer Antibiotics in, by Frederick G. Novy, Jr., Oakland (Or.) 201
Detection of Pulmonary Tuberculosis — Comparative Value of Routine Radiologic Examinations and Routine Laboratory Procedures, by Homer D. Peabody, Jr., and R. H. Sundberg, San Diego (Or.) 450
Diagnostic Problem in Asthma, The, by J. Harvey Black, Dallas, Texas (Or.) 369
Dietary Proteins vs. Tuberculosis, by W. H. Manwaring, Palo Alto (LE) 248
Dihydrogenated Alkaloids of Ergot in Treatment of Peripheral Vascular Diseases, by Roy J. Popkin, Los Angeles (Or.) 108

E

Early Diagnosis of Strangulation Obstruction of the Small Intestine, by Harold P. Totten, Inglewood (Or.) 365
Early Fatal Case of Infantile Toxoplasmosis in California, An, by Jacob Karl Frenkel and Howard C. Naffziger, San Francisco (CR) 174
Effect of New Drugs on the Rhythmic Function of the Heart, The, by M. H. Nathanson and H. Miller, Los Angeles (Or.) 215
Effects of Cortisone and Adrenocorticotropic Hormone (ACTH) on Certain Rheumatic Diseases, by Edward W. Boland, Los Angeles (Or.) 405
Endocarditis Lenta Due to Staphylococcus Aureus—Report of a Case, by James H. Thompson, San Francisco (CR) 118
Endometriosis, by Woodburn K. Lamb, Berkeley (Or.) 113
Epinephrine Hand Nebulizer in Asthma: Technique of Use, Clinical Aspects, by A. M. Targow, Los Angeles (Or.) 461
Erythroblastosis, Treatment of—What's New in Pediatrics, by Clement J. Molony, Beverly Hills (Or.) 89
Excretion of Digitoxin, The, by René Bine, Jr., Meyer Friedman and Sanford O. Byers, San Francisco (Or.) 14

F

Fatal Acute Agranulocytosis Following Prolonged Administration of Small Doses of Sulfadiazine for Urinary Bacteriostasis, by Matthew Marshall, Jr., Thaddeus M. McNamara, Jr., and John W. Schulte, San Francisco (CR) 390
Fractures and Dislocations of the Carpus, by Kellogg Speed, Chicago (Or.) 93

G

Gastric Resection, Syndrome of Proximal Jejunal Loop Obstruction Following Anterior, by William F. Quinn and John H. Gifford, Los Angeles (Or.) 18
Gastrointestinal Allergic Disease, by Chester M. Jones, Boston (Or.) 1

H

H. Gordon MacLean, President-Elect (CMA) 470
Habitual Abortion, by Ralph C. Benson, San Francisco (Or.) 442
Health Insurance, the C.M.A. and the Governor (I) 256
Heart, The Effect of New Drugs on the Rhythmic Function of, by M. H. Nathanson and H. Miller, Los Angeles (Or.) 215
Hess Committee Report, The (Ed.) 65
Histamine and the Antihistaminic Drugs, by Edmund L. Keeney, San Diego (MP) 377
Hospital Construction, Public Funds for (CMA) 124
Hypertensive-Ischemic Leg Ulcers, by Eugene M. Farber and Otto E. L. Schmidt, San Francisco (Or.) 4
Hypnotic Drugs Licensing Requirements (I) 259

I

Indications for Pulmonary Resection in Infants and Children, by John C. Jones, Los Angeles (Or.) 352
Indigents, Medical and Hospital Care of by Counties, Statement of Principles on (CMA) 183
Industrial Fee Schedule (CMA) 126
Industrial Fees for 1950 (Ed.) 182
Insecticides and Scabicides, Newer, C. J. Lunsford, Oakland (Or.) 350
Intestine, Small, Early Diagnosis of Strangulation Obstruction of, by Harold P. Totten, Inglewood (Or.) 365

K

Kidney, Some Aspects of the Management of Bilateral Calculus Disease of, by R. H. Flocks, Iowa City, Iowa (Or.) 7
Know Thyself (Ed.) 248

L

Lipid Metabolism, by Harry J. Deuel, Jr., Los Angeles (Or.) 197
Liquid Nitrogen in the Treatment of Skin Disease, by H. V. Allington, Oakland (Or.) 156

M

Medical and Hospital Care of Indigents by Counties, Statement of Principles on (CMA) 183
Membership Dues—Change in A.M.A. By-Laws (CMA) 125
Meningitis, Tuberculous, Streptomycin in, with Emphasis on the Toxicity of Streptomycin, by Daniel J. Vracin, Downey (CR) 120
Migraine, The Treatment of, Results with Dihydroergocornine Methanesulfonate (DHO 180) and Other Ergot Derivatives, by Nicholas A. Bercel, Los Angeles (Or.) 234

N

Nasal Operations, Physiologic Basis of, A. C. Hilding, Duluth, Minnesota (Or.) 103
Neurological Program of the Veterans Administration, The, by Walter F. Schaller, San Francisco (Or.) 164
Neurotics?, Who Are Prospective, by Julius Bauer, Los Angeles (Or.) 204
Newer Antibiotics in Dermatology, The, by Frederick G. Novy, Jr., Oakland (Or.) 201
Newer Insecticides and Scabicides, by C. J. Lunsford, Oakland (Or.) 350
Newer Methods for Selection of Patients for Lumbar Sympathectomy, by Travis Winsor, Los Angeles (Or.) 342
Niemann-Pick's Disease and Its Relationship to the Lipoidoses—Report of a Case, by Ralph E. Knutti, Los Angeles (CR) 60
"Non-Paralytic Poliomyelitis," by W. H. Manwaring, Palo Alto (LE) 66

O

Osteoarthritis, Some Recent Advances in the Symptomatic Treatment of, by Richard D. Miller, Pasadena (Or.) 373

P

Pancreatic Cysts Simulating Carcinoma of the Head of the Pancreas — Report of Two Cases, by Carleton Mathewson, Jr., and Roy Cohn, San Francisco (CR) .. 176
Pancreatitis, Acute, by John R. Paxton, Glendale, and J. Howard Payne, Los Angeles (Or.) 142
Pancreatitis, Chronic Relapsing, by Dwight L. Wilbur, San Francisco (Or.) 145
Paralysis Agitans, The Symptomatic Treatment of, with Benadryl: Report of Two Cases, by Edwin Owyang, San Francisco (CR) 57
Paroxysmal Tachycardia in Infancy—What's New in Pediatrics, by Eugene B. Levine, Los Angeles (Or.) 91
Pathology and the Pathologist in the Cancer Program, by William O. Russell and J. Louis Neff, Houston, Texas (Or.) 170
Penicillin for Treating V.D. in Indigent Patients (I) 259
Peripheral Vascular Diseases, Dihydrogenated Alkaloids of Ergot in the Treatment of, by Roy J. Popkin, Los Angeles (Or.) 108
Physiologic Basis of Nasal Operations, by A. C. Hilding, Duluth, Minnesota (Or.) 103
"Poliomyelitis, Non-Paralytic," by W. H. Manwaring, Palo Alto (LE) 66
Poliomyelitis, Tracheotomy in Bulbar, by Alden H. Miller and Leonard S. Buck, Los Angeles (Or.) 34
Porphyria, A Case of Acute; Remissions Induced with Procaine Intravenously, by H. A. Grubschmidt, St. Helena (CR) 243
Pregnancy, Diagnosis of, The Use of the Male California Toad in, by Donald A. Johnson, Tulare (Or.) 422
Professional Incomes (Ed.) 469
Psychiatric Problems in Children, by S. A. Szurek, San Francisco:
  Part I 357
  Part II 454
Public Funds for Hospital Construction (CMA) 124
Public Health and Public Agencies Committee, The (CMA) 249
Public Health Progress (Ed.) 247
Public Health, Recent Trends in, by Malcolm Merrill, Berkeley (Or.) 22
Pulmonary Resection, Indications for in Infants and Children, by John C. Jones, Los Angeles (Or.) 352

R

Recent Trends in Public Health, by Malcolm Merrill, Berkeley (Or.) 22
Resolution on Voluntary Welfare Agencies (CMA) 251
Rheumatic Diseases, Effects of Cortisone and Adrenocorticotropic Hormone (ACTH) on Certain, by Edward W. Boland, Los Angeles (Or.) 405
Rheumatic Fever—What's New in Pediatrics, by Robert G. Shirley, Beverly Hills (Or.) 85
Ruptured Cervical Intervertebral Discs, by C. Hunter Shelden and Robert H. Pudenz, Pasadena (Or.) 156

S

Scabicides, Newer Insecticides and, by C. J. Lunsford, Oakland (Or.) 350
Shoe-Fitting Fluoroscope as a Radiation Hazard, The, by Leon Lewis and Paul E. Caplan, Berkeley (Or.) .. 26
Simple Transfusion Kit for Occasional Use, A, by W. R. MacLaren, Pasadena (Or.) 453
Skeletal Suspension in the Treatment of Decubiti, by Albert G. Clark, San Francisco (Or.) 447
Skin Disease, Liquid Nitrogen in the Treatment of, by H. V. Allington, Oakland (Or.) 156
Some Aspects of the Management of Bilateral Calculus Disease of the Kidney, by R. H. Flocks, Iowa City, Iowa (Or.) 7
Some Phases of Postoperative Atelectasis—The Role of Ciliary Action in the Absorption of Air, by A. C. Hilding, Duluth, Minn. (Or.) 208
Some Recent Advances in the Symptomatic Treatment of Osteoarthritis, by Richard D. Miller, Pasadena (Or.) 373
Statement of Principles on the Medical and Hospital Care of Indigents by Counties (CMA) 183
Streptomycin in Tuberculous Meningitis with Emphasis on the Toxicity of Streptomycin—Report of a Case, by Daniel J. Vracin, Downey (CR) 120
Surgical Emergencies, by Felix R. Rossi, Jr., Fairfield (Or.) 222
Surgical Management of the Injured Large Bowel, by Samuel Gendel, Anaheim (Or.) 37
Sympathectomy, Lumbar, Newer Methods for Selection of Patients for, by Travis Winsor, Los Angeles (Or.) 342
Symptomatic Treatment of Paralysis Agitans with Benadryl, The—Report of Two Cases, by Edwin Owyang, San Francisco (CR) 57
Syndrome of Proximal Jejunal Loop Obstruction Following Anterior Gastric Resection, The, by William F. Quinn and John H. Gifford, Los Angeles (Or.) 18

T

Testes, Undescended, by W. H. Snyder, Jr., William Van Valin, and Lawrence Chaffin, Los Angeles (Or.) 239
Toxoplasmosis, Infantile, An Early Fatal Case of, in California, by Jacob Karl Frenkel and Howard C. Naffziger, San Francisco (CR) 174
Tracheotomy in Bulbar Poliomyelitis, by Alden H. Miller and Leonard S. Buck, Los Angeles (Or.) 34
Treatment of Erythroblastosis, What New in Pediatrics, by Clement J. Molony, Beverly Hills (Or.) 89
Treatment of Migraine—Results with Dihydroergocornine Methanesulfonate (DHO 180) and Other Ergot Derivatives, The, by Nicholas A. Bercel, Los Angeles (Or.) 234
Treatment of Miliary and Meningeal Tuberculosis in Infants and Children, by Thomas L. Perry, Los Angeles (Or.) 159
Tuberculin "Activator," by W. H. Manwaring, Palo Alto (LE) 123
Tuberculosis, Dietary Proteins vs., by W. H. Manwaring, Palo Alto (LE) 248
Tuberculosis, Pulmonary, Detection of — Comparative Value of Routine Radiologic Examinations and Routine Laboratory Procedures, by Homer D. Peabody, Jr., and R. H. Sundberg, San Diego (Or.) 450
Tuberculosis, Treatment of Miliary and Meningeal, in Infants and Children, by Thomas L. Perry, Los Angeles (Or.) 159
Typhoid Fever, Chloramphenicol in the Treatment of, by Leon Rosove, Santa Monica, Jack S. Chudnoff, Los Angeles, and Albert G. Bower, Pasadena (Or.) 425

U

Unauthorized Treatment—Scope of Consent (MJ) 264
Undescended Testes, by William H. Snyder, Jr., William Van Valin and Lawrence Chaffin, Los Angeles (Or.) 239
Use of the Male California Toad in the Diagnosis of Pregnancy, The, by Donald A. Johnson, Tulare (Or.) .. 422

V

Voluntary Welfare Agencies, Resolution on (CMA) 251

W

What Is an Internist?, by Verne R. Mason, Beverly Hills (Or.) 226
What's New in Pediatrics—Panel Discussion (Or.) 79
  Communicable Diseases, by Evelynne Knouf, South Pasadena (Or.) 79

Paroxysmal Tachycardia in Infancy, by Eugene B. Levine, Los Angeles (Or.) 91
Rheumatic Fever, by Robert G. Shirley, Beverly Hills (Or.) 85
Treatment of Erythroblastosis, by Clement J. Molony, Beverly Hills (Or.) 89
Who Are Prospective Neurotics?, by Julius Bauer, Los Angeles (Or.) 204
World Medical Association, The (Ed.) 122

EDITORIALS

A.M.A. Clinical Session 64
A.M.A. in San Francisco 392
Catastrophe Coverage 181
Chronic Diseases and Government 392
Hess Committee Report, The 65
Industrial Fees for 1950 182
Know Thyself 248
Professional Incomes 469
Public Health Progress 247
World Medical Association, The 122

CALIFORNIA MEDICAL ASSOCIATION

Alcoholism—Studies by a Special Committee of the California Medical Association (Or.) 40
Annual Session Programs and Reports 265
Brochure on Medical Economics 126
Change in A.M.A. By-Laws—Membership Dues 125
Council Meeting Minutes—
  366th Meeting, November 20, 1949 67
  367th Meeting, January 14, 1950 184
  368th Meeting, March 19, 1950 394
C.P.S. Finances 253
C.P.S. to Change Contracts and Fees Only Once Yearly 189
Executive Committee Meeting Minutes—
  217th Meeting, December 14, 1949 187
  218th Meeting, December 22, 1949 187
  219th Meeting, February 16, 1950 250
  220th Meeting, March 19, 1950 397
H. Gordon MacLean, President-Elect 470
Industrial Fee Schedule 126
Indigents, Medical and Hospital Care of by Counties, Statement of Principles on 183
New Postgraduate Seminar Director 126
Public Funds for Hospital Construction 124
Public Health and Public Agencies Committee, The 249
Questions and Answers About C.P.S. 252, 399, 473
Resolution on Voluntary Welfare Agencies 251
Statement of Principles on the Medical and Hospital Care of Indigents by Counties 183

INFORMATION

Health Insurance, the C.M.A. and the Governor 256
Hypnotic Drugs Licensing Requirements 259
Penicillin for Treating V.D. in Indigent Patients 259

MEDICAL JURISPRUDENCE

Unauthorized Treatment—Scope of Consent 264

BOOK REVIEWS

Allergy in Relation to Otolaryngology 193
Atlas of Human Sex Anatomy, An 194
Atlas of Obstetric Technic 75
Atlas of Surgical Operations 402
Atlas of the Blood and Bone Marrow, An 262
Blakiston's New Gould Medical Dictionary 78
British Surgical Practice, Vol. III, IV and V 403
Bulletin on Narcotics 193
Clinical Biochemistry 78
Clinical Diagnosis by Laboratory Examination 404
Cystoscopy and Urography 193
Descriptive Atlas of Radiographs, A 77
Development of Gynæcological Surgery and Instruments 261
Diabetes and Its Treatment 196
Diagnosis and Treatment of Brain Tumors and Care of the Neurosurgical Patient 263
Diseases of the Aorta 477
District Nursing 195
Doctor and Patient and the Law 403
Early Carcinoma of the Uterine Cervix 77
Epidemiology of Hemolytic Streptococcus, During World War II in the United States Navy, The 75
Essentials of Obstetrical and Gynecological Pathology 260
Essential Urology 262
Eye and Its Diseases, The 262
From the Hills 260
Fundamentals of Otolaryngology 76
Green's Manual of Pathology 195
Health Instruction Year Book 402
Helpful Hints to the Diabetic 404
Human Growth 193
Intestinal Intubation 402
Limbo Tower 404
Malaria—The Biography of a Killer 261
Malignant Disease and Its Treatment by Radium 77
Manual for Penicillia, A 131
May's Manual of the Diseases of the Eye 194
Modern Practice in Anesthesia 404
Modern Practice in Ophthalmology—1949 195
Modern Practice in Psychological Medicine—1949 132
Modern Surgical Technique 403
More About Psychiatry 477
Mycoses and Practical Mycology 76
Normal Values in Clinical Medicine 478
Obstetrics and Gynecology 195
Operations of General Surgery 76
Oral Bacterial Infection, Diagnosis and Treatment 132
Physiology of Heat Regulation and the Science of Clothing 478
Physiology of the Nervous System 261
Physiology of the Uterus 261
Premature Baby, The 263
Progress in Neurology and Psychiatry 402
Question of Lay Analysis, The 260
Questions, Medical State Board, and Answers 477
Rational Medicine 131
Recent Advances in Physiology 260
Roentgen Diagnosis of Diseases of the Skull 132
Selected Papers of Haven Emerson 263
Sexual Criminal, The—A Psychoanalytical Study 260
Stedman's Medical Dictionary 477
Stern's Applied Dietetics 131
Surgery of the Hand 196
Surgical and Maxillofacial Prosthesis 402
Synopsis of Hernia 77
Synopsis of Medicine, A 194
Textbook of Medical Treatment 78
Textbook of Neuropathology, A 77
Textbook of Ophthalmology, Vol. IV 131
Textbook of Pharmacognosy, A 77
Textbook of Surgery by American Authors, An 263
Tuberculosis 478
Twentieth Century Physician, A 194
Urologic Roentgenology 403
X-Ray Treatment—Its Origin, Birth and Early History 131
Yellow Emperor's Classic of Internal Medicine, The 477
Zinsser's Textbook of Bacteriology 75

DEATH NOTICES

Abramson, Max Jacobs 70
Anderson, Harry Elden 70
Armstrong, Eugene Lawson 251
Babcock, Donald Tisdale 70
Baker, Clark Dyer 397
Barrow, William Hulbert 472
Bittner, Clarence Lavan 70
Boone, William Roscoe 397
Bramble, Earl G. 127
Burton, James Willoughby 127
Chamberlin, Harrie H. 397
DaCosta, A. Antonio 472
Darrow, Arthur Charles 397
DePuy, Clarence Augustus 397
Derrick, Joseph Stephen 70
Draper, David Burris 189
Dunn, Richard Henry 397
Durr, Samuel Abraham 127
Frohman, Bertrand Sydney 127
Garstang, Donald Buie 397
Gibbons, Morton Raymond 70
Gloor, Eugene Edwin 127
Goldberg, Albert Tobias 127
Huntington, Herbert Arthur 397
Jennings, Alfred Norman 127
Johnston, William Arthur 127
Kane, Louis Matthew 251
Lee, Helen 70
Lewis, Floyd B. 189
Linde, Frederick George 70
Lowy, Emil 70
Marks, Selby Harold 127
Marsh, Otto George 398
McCarty, Ray Bardwell 472
McGarvey, Harry 127
McGinty, Arthur Thomas 70
McNeile, Olga 472
Michelson, Paul Daniel, Jr. 189
Miller, George Herbert 127
Montgomery, Robert Clyde 472
Moore, Jack Beals 398
Morrison, Wayland Augustus 189
O'Neill, Bernard Joseph 472
Page, Clarence Winslow 189
Parker, Truman Alfred 70
Poheim, Joseph Francis 70
Pomeroy, Frank Kenneth 472
Reeves, James Walter 251
Reynolds, Earl Owen 472
Richter, Conrad 398
Rydholm, Carl Oliver 70
Schuster, Emile Gabriel 127
Sheld-Ritchie, Iner 472
Shryock, Alfred Quimby 251
Smith, James Franklin 70
Solomon, William Otto 398
Stoops, Roy Philson 398
Sullenberger, Perry K. 70
Sumerlin, Harold Stanley 251
Thorpe, Arthur Clyde 70
Uhls, Russell Todd 251
Verhalen, John 472
Walker, George Alvin 472
Waters, Zura Orthello 472
Weber, Arthur Leo 398
Wharton, Joseph Earl 472
Whiffen, Roscoe Albert 398
Wood, Frederick Webster 127
Yoakam, Frank Arthur 189
Zochert, Lebrecht W. 398

V. 72 1950 37150

California medicine